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Observations
ON
THE PNEUMONOCONIOSES *

BY

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Although dust diseases of the lung have been recognized in this country for many years, for most of our exact knowledge of the pathology of the condition we have to consult South African experience, because, for reasons into which I need not enter here, an intensive study of pneumonoconiosis has been carried out in Johannesburg for the last twenty years in a way which has not been approached in any other part of the world. But South African workers have had to consider only one form of pneumonoconiosis—that due to the presence in the atmosphere of the Rand mines of crystalline silica in a high degree of concentration. In this country we have to deal with various trades and industries in which a comparable atmospheric pollution occurs. But this is only part of our problem. In many industries the workers are exposed to dusty atmospheres into the composition of which silica does not enter at all, or only in a minor degree, and such questions are constantly arising as: Is silica the only form of dust capable of producing pneumonoconiosis? Must the silicon be present as silica, the dioxide of silicon, or is it dangerous when in the form of a silicate? Is the action of silica modified by the presence of other dusts, and, if so, is this modification merely a matter of dilution, or do the adulterant dusts specifically inhibit or alter the action of the silica? What action on the lung, if any, have non-siliceous dusts if inhaled over a considerable period of time?

It might be supposed that these and similar questions are capable of being answered by ordinary human and medical experience, but, if only for the sake of argument, I am prepared to adopt a rather extreme attitude, and to assert that our human and medical experience in these matters is so conflicting and so poorly substantiated by definite facts as to be worth very little. I am not very impressed by the accuracy of the mortality statistics which represent the scientific data on which many generalizations about pneumonoconiosis have been based, and until we have at our disposal a mass of statistics composed of the correlated observations of the clinician, the radiologist, and the pathologist, we shall be wise in approaching the problems with unprejudiced minds. I do not wish to labour the point, but to take only one instance, the work of Cummins and Sladden[1]—of which no doubt we shall hear more later—dangerously disturbs the doctrine of the immunity of the coal miner to silicosis, and all that that implies. If we are to answer the questions formulated above we must build up our own statistics, and must supplement our observations on the human being by recourse to experimental animals.

ACTION OF SILICA ON THE LUNGS

We know a good deal about the action of silica on the lungs. Largely owing to the labours of South African workers the characteristic silica lesion is now well recognized, and we may adopt silicosis as our paradigm of a pneumonoconiosis. It is, I think, generally agreed that silica is soluble in the tissue fluids, and that its action is, broadly speaking, chemical and not physical. There is, however, still some doubt concerning the exact method of the production of the characteristic nodule and its distribution in the lung. Strachan and Simson[2] lay great stress on the localization of silica-containing phagocytes in the pulmonary lymphadenoid tissue, and I gather that Dr. Gardner[3], whose experience of the dusting chamber is unrivalled, supports this view. It may be so, and my experience of both human and experimental material is so much less than theirs that I hesitate to register more than a tentative difference of opinion. But my experimental material suggests to me that the nodule can form apart from lymphoid tissue and without the intervention of the fibroblast. Some of my preparations seem to me to lend a good deal of support to the view, which I put forward as a working hypothesis, that collagen may be deposited around and in the neighbourhood of silica-containing phagocytes by a process of gelation of an intercellular colloidal sol.

However this may be, we are all agreed that the continued presence of crystalline silica in the lung is followed by the gradual development of a characteristic fibrosis. Does any other dust produce a similar change? In recent years abundant evidence has accumulated showing that asbestos does, though the fibrosis in the asbestos lung differs in type and distribution from that induced by silica. These differences are probably due to the size of the asbestos particles and their transport in the lung; the process seems to be essentially the same in both cases, and the silicate asbestos provides us with an example of a dust other than crystalline silica which is capable of producing pulmonary lesions. But this is the only one we have. Other silicates, kaolin for instance, are held to be entirely innocuous, as are also the non-siliceous dusts. But as a pathologist I must confess that I have been amazed at the way in which the industrial worker can tolerate the presence of ounces, if not pounds, of foreign material in his lungs without apparently feeling any ill effects. In the post-mortem room one is constantly being asked the question: Why did the patient die? My immediate reaction is usually to reply: "I don't know, but can you tell me how he could possibly have survived long enough to develop this extraordinary condition?" It is true that the body can compensate in a marvellous way for the most remarkable structural derangements, but nevertheless I have found it difficult to believe, when examining the lungs of, say, a haematite miner, that they came from the body of a man who had suffered from no occupational incapacity.

ACTION OF SILICA MODIFIED BY OTHER DUSTS

Another question, which is as important as it is difficult, is the modification of the silica reaction by other dusts. In one group of cases the inhalation of silica combined with an alkali has been thought to cause an unduly rapid development of fibrosis, an acute silicosis, due to the increased solubility of the silica. I am doubtful myself whether the alkalinity of the tissues can be sufficiently increased to affect the solubility of silica without the production of an acute inflammatory reaction, and in such cases of acute silicosis as I have actually examined the condition present was an acute tuberculosis, enhanced, no doubt, by the silica present.

The opposite side of the picture—the influence on silica of other dusts in the direction of weakening or inhibiting its action—is of far greater practical and theoretical importance. The recognition of this possibility rests partly on statistical evidence, partly on experimental observations. I have already questioned the doctrine that coal dust protects the coal miner against the deposit of silica in his lungs. Even more unconvincing is the claim that atmospheres containing over 80 per cent. silica are harmless to workers in the refractories industries because of the presence of less than

* Read in opening a discussion in the Section of Pathology at the Centenary Meeting of the British Medical Association, London, 1932.

10 per cent. of alumina in the dust. Experimentally A. Mavrogordato,[4] H. M. Carleton,[5] and F. Haynes[6] have studied the early pulmonary reactions in experimental animals following moderate exposures to dusty atmospheres, and have obtained evidence of the protective action of adulterant dusts. My criticism of these experiments is that they have not been continued to the end point, and unequivocal lesions have not been produced in an adequate number of control animals. And in respect to the statistical evidence, I may say quite frankly that I find it difficult to believe. I should like to be able to do so, because it would be of immense value to us industrially if we could neutralize one dust with another, but I am not convinced of the reliability of the data on which the mortality and morbidity tables are based.

Relation Beween Silicosis and Tuberculosis

So far I have only considered the simple effect of dust on the lung ; a much more important aspect of pneumonoconiosis is the influence of inhaled dusts on pulmonary infections, particularly tuberculosis. There is abundant evidence, both clinical and experimental, that silica in the tissues enhances the proliferative power of the tubercle bacillus, and while silica alone may produce such extensive pulmonary fibrosis as to cause death from cardiac failure, it is chiefly dreaded because of its association with tuberculosis. A rapidly progressing tuberculosis may supervene upon a recognized silicosis, or silicosis and tuberculosis, each modified by the other, may develop in the lung more or less simultaneously ; and there can be no doubt that a latent tuberculosis may lighten up in the presence of silica dust.

Exactly how the silica influences the bacillus is not known. It is not merely a question of fibrosis, for there is nothing to suggest that a fibrotic lung is peculiarly susceptible to tuberculosis, and, in fact, in many individuals the infective element is recognizable long before the characteristic fibrosis has developed. There is, however, much evidence to show that, as it dissolves, silica combines with protoplasm and converts it into a particularly favourable pabulum for the growth of the bacillus.

A reaction of this kind has not been demonstrated satisfactorily *in vitro*, nor is it always apparent *in vivo*. In experimental animals the proliferation of tubercle bacilli in silicotic tissues is often very unequal, and I have been struck by the extreme variations in the bacillary content of the lesions met with in different cases of human tuberculo-silicosis. In some lungs which I have examined tubercle bacilli are present in enormous numbers; in others, with a very similar histology, they are extraordinarily scanty or absent altogether. This kind of thing is, of course, familiar to all of us in uncomplicated cases of tuberculosis, and the number of bacilli demonstrable in lesions by ordinary methods is no criterion of the rapidity or severity of the infection. Bacteriolysis is only one of the factors in the immunity reaction to the tubercle bacillus, and in the absence of adequate means of coping with the endotoxins liberated by bacterial destruction it does far more harm than good. But the growth of tubercle bacilli in the tissues can be studied with some degree of accuracy in an animal like the mouse, which is naturally highly resistant to tuberculosis, for errors due to variations in the susceptibility of individuals are reduced to a minimum. In these animals it can be shown with reasonable constancy that tubercle bacilli grow with far greater readiness in tissues saturated with silica than in normal tissues, or in lesions produced by other substances. Nevertheless, even in the mouse this phenomenon is not something entirely new ; it is only a modification of a normal process, for tubercle bacilli do grow in the uninjured tissues of the animal, and in lesions not due to silica. All we can do at present is to suggest that silica in some way alters the tissues so as to make them less resistant to the organism. The result of this alteration may be to determine a fulminating infection, or it may just swing the balance slightly in favour of the organism and convert an obsolescent or latent infection into a slowly progressing one.

Infective Silicosis

It is important to realize that the combination of silica and the tubercle bacillus in the lung does not necessarily imply an acute and dramatic pulmonary tuberculosis. In South Africa a condition known as infective silicosis is well recognized. It is, as I understand it, a slowly progressing lesion in which necrosis and fibrosis proceed side by side with a preponderance of the latter. Although the organism has not been demonstrated in many of the cases, it is believed that the tubercle bacillus is the chief infecting agent, and it is suggested that the chronicity of the lesion is due partly to the damaging effect of the silica on the organism as well as on the tissues, and partly to the limitation of the advancing lesion by fibrosis. I do not think this explanation is likely to be true, for all the evidence suggests that the influence of silica on the tubercle bacillus is invariably favourable to its proliferation, and I find it difficult to visualize a continuous process of encapsulation in a progressive lesion. I would rather suggest that infective silicosis is an example of a chronic tuberculosis in an individual whose resistance, naturally high, is so modified by the presence of silica that a low-grade progressing infection results, accompanied by the excessive fibrosis one might expect in such a process.

My experience of human pneumonoconiosis is relatively small, but I am becoming more and more impressed by the importance of the infective element in this disease as we see it in England, and the difficulty of the differential diagnosis between infective or tuberculo-silicosis and chronic fibrous tuberculosis. I have received for examination lungs from several cases of silicosis, but in very few of them have I found what I regard as pure silicotic lesions. On the other hand, I have constantly found fibro-caseous tuberculosis, often, it is true, with a nodular distribution, but differing only in the greater extent of the lesions from the chronic tuberculosis encountered in ordinary hospital work. Some of these lungs contain a high content of silica, and I do not doubt that they are examples of something more than simple, uncomplicated tuberculosis. But I find it extremely difficult to determine in many cases whether or not silica has played any part in the production of the lesions. South African workers have been fortunate in that their pneumonoconiosis has been concentrated in a small area, and it has been relatively easy for them to adopt uniform standards in their clinical and pathological diagnosis. We are not so happily situated in this country, and it is all the more necessary that we should make every effort to come to agreement about the nature and classification of the various pulmonary lesions we may encounter. Until we can arrive at satisfactory pathological standards we shall not be in a position to take our part in that correlation of the clinical, radiological, and pathological observations which seems to me to be necessary.

Relation of Other Dusts to Tuberculosis

Until a few years ago it was believed that crystalline silica was the only dust which had any aetiological relation to pulmonary tuberculosis. Recently, however, it has become clear that asbestos acts in much the same way, and the question arises whether other dusts may not do likewise. I believe that this question can be answered with a fair degree of certainty by a relatively simple experimental test.[7] I have found that dusts which are recognized as innocuous when inhaled into the lungs are also

inert when inoculated into the subcutaneous tissues of an animal such as the mouse. Silica and certain silicates, on the other hand, are active irritants, and produce recognizable tissue reactions. Furthermore, the intravenous inoculation of tubercle bacilli into animals prepared by previous subcutaneous injections of dusts results in the settlement and proliferation of bacilli in the active dust lesions to a demonstrably greater degree than occurs in the deposits of the inert dusts. So far as I can see, this method provides a reliable means of determining whether or not any particular substance has the power of enhancing the growth of tubercle bacilli in the body. It should also, I think, enable us to form some idea whether a dust is itself capable of producing lesions in the lung. So far as our knowledge goes at present, inhaled dusts are dangerous only when they become soluble in the body and act as tissue poisons ; large amounts of inert dusts cause no pulmonary disability because they are incapable of producing anything more than a minor tissue reaction. It may very well be that the action of a dust on the tissues is considerably modified by the way in which it is presented to them. Dust which is slowly picked up from the surface of the lung by phagocytosis may act very differently from dust which is injected directly into the tissues ; nevertheless, its final and fundamental action must be the same. And it seems reasonable to suppose that a substance which produces an active reaction in the subcutaneous tissues will be capable of causing lesions in the lung itself.

This simple method, however, will not solve some of the more complicated problems with which we are faced. It will not, for example, help us in the study of the action of combined dusts in the lung, nor will it help us to determine the exact degree to which infection enters into the production of pneumonoconiosis. For these and other problems we must revert to direct observation on the lung itself. It does not necessarily follow, however, that our investigations should be bound by the limitations of the dusting chamber ; there are other ways in which particulate matter may be presented to the lung than in the inspired air. R. Hilton and I[8] have recently described a method of introducing dust into the lung by direct intratracheal injection. It is not necessary to recapitulate the advantages of this method over the inhalation technique, but so far our results have been so promising as to suggest that we have now a means of investigating experimentally in any ordinary laboratory many of the problems of pneumonoconiosis which so urgently demand solution.

REFERENCES

[1] Cummins, S. Lyle, and Sladden, A. F.: *Journ. Path. and Bact.*, 1930, xxxiii, 1095.
[2] Simson, F. W., and Strachan, A. Sutherland: Silicosis in South Africa, *Proc. Transvaal Mine Med. Off. Assoc.*, 1931, x, No. 118.
[3] Gardner, L. U.: *Journ. Indust. Hyg.*, 1932, xiv, 18.
[4] Mavrogordato, A.: *Studies in Experimental Silicosis and other Pneumonoconioses*, Publications, South African Institute for Medical Research, 1922.
[5] Carleton, H. M.: *Journ. Hygiene*, 1923–24, xxii, 438.
[6] Haynes, F.: Ibid., 1931, xxxi, 86.
[7] Kettle, E. H.: *Journ. Path. and Bact.*, 1932, xxxv. 395.
[8] Kettle, E. H., and Hilton, R.: *Lancet*, 1932, i, 1190.

RADIOLOGY IN DISEASES OF THE LUNGS*

BY

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It has always appeared to me that the great value of these Annual Meetings lies in the fact that they afford an opportunity to review the work of the past and to see if recent work has anything of value for us. With this thought in my mind I feel that the advantage of a combined discussion between clinician and radiologist is inestimable. It ought to show us team work at its best ; and what is good for us is, I would suggest, good also for our patient. For example, the radiologist is asked to give an opinion on the *x*-ray appearances, as indicating or contraindicating the production of artificial pneumothorax. This is a question that he is perfectly qualified to answer, but the matter does not end here. The clinician is the sole judge of the clinical fitness of the patient.

The value of radiology in the diagnosis of lung disease has now taken its place as one of supreme importance ; indeed, it is difficult to imagine any clinician giving a lecture without illustrating it with radiograms. I know when we have a class at Brompton, and it comes to the turn of myself or my co-workers in the *x*-ray department to give a lecture, it is an extremely difficult matter to find suitable pictures, our clinical colleagues having taken them all. A. Salusbury MacNalty, in his recent illuminating report, well presents the attitude of to-day in relation to radiography of the chest. He says: "From a former tendency to disparage chest radiograms, the pendulum has swung too far in the other direction. Some enthusiasts diagnose pulmonary tuberculosis solely on *x*-ray evidence, and ignore the results of orthodox physical examination. This attitude is as mistaken as would be that of the clinician of to-day who, when diagnosing pulmonary disease, neglected to take into account the *x*-ray picture."

* Read in opening a discussion in the combined Sections of Radiology and Medicine at the Centenary Meeting of the British Medical Association, London, 1932.

PULMONARY TUBERCULOSIS

With regard to the value of *x*-ray examination in the diagnosis of pulmonary tuberculosis, I think I am not overstating the case in putting it as follows :

1. Definite infiltration can be demonstrated upon an *x*-ray film at quite an early stage of the disease, and frequently before definite physical signs are present.

2. Consistently negative *x*-ray evidence, extending over a period of some months, may be taken as conclusive proof of the non-existence of pulmonary tuberculosis.

3. In cases in which physical signs are present it may be assumed that the initial stage has passed, and, in such cases, the *x*-ray picture will as a rule show much more extensive disease than can be demonstrated by physical examination.

As to the incidence of pulmonary tuberculosis, I think there is still some cleavage in our ranks, more especially in relation to the part played by the mediastinal glands. Leaving out the epoch-making researches of Stanley Griffith on the question of bovine tuberculosis, I should like to find some agreement among us on the important question of lung tuberculosis in the infant and in the adult. I should like to make confession of what a long period of work at Brompton Hospital has led me to believe. I believe that the tubercle bacillus gains an entrance into the lung by "aspiration" in the vast majority of cases, and it is also my belief that, in the adult, any further invasion is of the nature of a "reinfection" (that is, exogenous). Against this view is that of many deep thinkers, past and present, who regard pulmonary tuberculosis much as they regard another of the infective granulomata, syphilis—namely, that one stage of the disease follows another in regular sequence, and that, even after a prolonged period of apparent inactivity, further manifestations may reveal themselves. To take this view is, I suggest, to disregard much of the work that has been done of late years upon the allergic state—the acquired reaction peculiar to the previously infected person.

In the infant the incidence of pulmonary tuberculosis would seem to depend upon the initial dosage and the

degree of resistance. If the dose be great and the resistance low, then we get an acute caseous bronchopneumonia (infantile phthisis), so rapid and so fatal as to be practically hopeless from the onset. If the dose is small and the resistance good, then the usual course is for the infant to get a primary lung focus in the lymphoid tissue found in the region of the smaller bronchi, with resulting response in the tracheo-bronchial glands. The work of Canti and Ghon in relation to this is so well known as to need no repetition. The small focus may be situated in any part of the lung parenchyma, and usually gives little or no clinical evidence of its presence. In due course the lung focus clears up and may entirely disappear, or it is revealed as a small oval or rounded dense opacity—a calcified nodule. The bronchial glands calcify in similar fashion, and the story is ended. On the other hand, the gland may not behave in this way. It may undergo extensive caseation and burst either into a bronchus or into a blood vessel. We may then get an aspiration infection in the case of the bronchus, or a miliary tuberculosis in the case of the blood vessel. In the former case the history is much as we might expect, depending upon the resistance and dosage—truly a "vicious cycle," as Professor Still has remarked.

Yet there is a school of thought that would ascribe all these changes to the glands themselves. As well might one argue that a thecal abscess was caused by a mass of glands in the axilla and not vice versa. Why should we submit the lung to a different pathology from that obtaining elsewhere?

Finally, just as we get a focal reaction in the region of a tuberculous gland elsewhere in the body, so we get a similar reaction in the area of a tuberculous gland in the mediastinum. Though this condition has been discussed under different names by many clinicians and pathologists from the time of Laennec and Virchow, the reaction is the same. It may be quite evanescent, disappearing within a few days, or it may be persistent or even recurrent. Clinical evidence may be slight, but there is usually some pyrexia and general malaise, *and the infant reacts positively to tuberculin*. This, I would submit, is evidence of local infection, and not of an active lesion. The *x*-ray evidence is definite, and shows an area, usually wedge-shaped, extending in any direction from the inflamed gland into the surrounding tissues. After a variable period of time this local area disappears entirely. To call such a condition by the name of pulmonary tuberculosis, with all that such a diagnosis entails, seems to me wrong.

Terminology

I should now like to say a little about certain matters of importance, not only to the radiologist, but to the clinician.

I would press for the general adoption of the word "infiltration" as describing a parenchymatous invasion by the tubercle bacillus. I am quite aware that in the strictly pathological sense this may not be accurate, but there is no other term that so aptly expresses what is in the mind of the radiologist. "Mottling" will obviously not suffice, for this word is much more applicable to the appearances seen in miliary tuberculosis, in the early stages of pneumonoconiosis, and in the coarse, mottled appearance seen in a miliary carcinoma. To apply the term "infiltration" to every departure from the normal is equally wrong, and increases the already great difficulties of reasonable interpretation.

The term "fibrosis" ought, in my submission, to be used in a wider sense than has recently been the case, as describing a condition of healing in which there is definite deviation of the mediastinal content to the affected side. In a parenchymatous invasion of the lung the first evidence of healing is found radiologically in the somewhat ill-defined and cloudy appearance becoming more linear in character, and this without any suggestion of deviation of the trachea or mediastinum. Such expressions as "active" or "healed" ought to be used with caution, or never used, seeing that such conditions are clinical rather than radiological. It is reasonable, in the state of our present knowledge, to draw a distinction between a "recent" and an "old" lesion, for the difference to the trained radiologist is very definite, and the value to the clinician is definite also.

Standardization

With the advent of modern apparatus and the ease with which we can reduce shadow deformity by radiography at two metres distance, or even less, there has emerged a tendency, which is quite natural, to adopt the upright posture for chest radiography. Failing this, the patient may be laid in the prone position on a couch with the film (casette) on the front of the chest and the tube at the requisite height above. The advantages are:

1. That the early screening can be done and the tube racked out for long-distance radiography without moving the patient.

2. That fluid levels in a cavity or in pleural effusions can be seen.

The disadvantages, equally definite, are:

1. That it is not possible to centre the tube with such accuracy as to obtain an identical picture months or even years after the original picture has been taken.

2. That it is impossible to deal with the ill patient, say, one who is on absolute rest following haemoptysis.

3. That the female breast is dependent and consequently throws a much more obstructive shadow than would otherwise be the case. It was with regard to these disadvantages that at Brompton Hospital, when we were constructing a new department, we wished to have all the advantages of distance and still be able to deal with the large numbers of stretcher cases. To my colleague, R. L. Rawlinson, I owe a suggestion which rapidly cleared up our difficulties—namely, that of cutting a hole in the floor. We discovered that a hole 1 foot square was amply sufficient, and it is easy to see how simple the matter is, provided only that there is a space available in the room below. As the tube is fixed the necessary shift of couch, which runs on rails and has a movable top, has to be provided for. The centring is done by means of a plumb-bob. There is one disadvantage only—namely, the fact that screening is not possible except for an instant of time.

Other Problems

As I am to be followed by a number of other speakers, I will not anticipate what is going to be said, save upon one or two points. As with the rest of enthusiasts, there are very many questions for which I look for an answer to-day. In lung abscess, for instance, what is the proportion of direct infections as compared with the great number that are of embolic infection, particularly in lung abscess following tonsillectomy? Why does "A," with marked infiltration of both lungs, resent being invalided, while "B," with a very slight infiltration of one zone, feels very ill and readily tired? Shall we find agreement on the still vexed question of the most suitable method of administering lipiodol in the diagnosis of lung conditions? These are just a few of the questions, and, knowing as I do the work and reputation of the speakers, I feel confident that the answers will be forthcoming.

Bibliography

[1] Ghon, A.: *The Primary Lung Focus of Tuberculosis in Children.* Translated by D. Barty King. 1916.

[2] Canti, R. G.: Primary Pulmonary Tuberculosis in Children, *Quart. Journ. of Med.*, October, 1919, xiii, No. 49.

[3] MacNalty, A. S.: A Report on Tuberculosis, Including an Examination of the Results of Sanatorium Treatment. London. 1932.

[4] Burrell, L. S. T.: *Recent Advances in Pulmonary Tuberculosis.* London. 1929.

RECENT ADVANCES IN THE KNOWLEDGE OF YELLOW FEVER*

BY

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In order to open a discussion upon our increased knowledge of yellow fever I feel that I should very briefly summarize the facts concerning the pathology and epidemiology of the disease which have recently been brought to light, and that I should devote my time mainly to a discussion upon the application of this knowledge to the problems affecting the control of the disease and the prevention of its spread to infectible countries which have as yet escaped infection. I have no personal knowledge of the recent work upon yellow fever except such as has been gained by a close association with the workers of the West African Yellow Fever Commission of the Rockefeller Foundation and by a visit to the Rockefeller Institute in New York, but the facts which that Commission has exposed recently with regard to the exceedingly wide distribution of the disease in West Africa have profoundly altered the views of my colleagues and myself, and in discussing the control of the disease I must bring into prominence the local difficulties which face the sanitary authorities in a country such as Nigeria.

RECENT RESEARCH UPON YELLOW FEVER

An excellent summary of recent work upon yellow fever has been made by Sawyer[1] in the Lamar Lecture given at the school of hygiene at the Johns Hopkins University. I shall follow his example and date recent knowledge from the discovery in 1927 by Stokes, Bauer, and Hudson[2] of the susceptibility of the *Macacus rhesus* and *M. sinicus* to yellow fever. This discovery led to the isolation of the "asibi" strain, upon which so much work has been done in West Africa. It was confirmed by Mathis, Sellards, and Laigret,[3] working at Dakar, who isolated the French strain and, later, by Aragao[4] and by Davis and Burke,[5] who isolated the Brazilian strains.

The discovery of a susceptible laboratory animal led to the confirmation of the work of the Reed group upon the *Aëdes* vector of the disease and to the proof that yellow fever is due to a filterable virus and not to the *Leptospira icteroides*. The development of the "protection test" in monkeys followed, when the workers in West Africa showed that the injection of a small quantity of serum from a patient who had recovered from the disease protected a monkey from a simultaneous injection of yellow fever virus, and this test incidentally settled the much-discussed point as to the identity of the disease in West Africa and in the Western Hemisphere. Sawyer, Kitchen, Frobisher, and Lloyd[6] proved conclusively by cross-immunization experiments that the disease was identical. The protection test proved that the immunity conveyed by an attack of the disease is usually lifelong—the serum from one patient who had suffered from the disease seventy-eight years previously protected monkeys. A recent advance in the application of the protection test has been due to the discovery of Theiler[7] that the yellow fever virus injected intracerebrally into white mice produces an encephalitis with intranuclear inclusions in the ganglion cells. By frequent passage a fixed neurotropic virus with heightened virulence was produced. This protection test has been elaborated by Sawyer and Lloyd,[8] and is the test now usually conducted. Briefly the principle consists of an intraperitoneal injection of the serum to be tested and the virus, while at the same time a mild irritant (starch solution) is injected into the brain to fix virus which enters the circulation.

The development of the protection test has profoundly modified our views upon the epidemiology of the disease, and it is upon the results of these tests, carried out by the Rockefeller Commission in West Africa, that I wish to base my discussion. Before proceeding to this, however, I must briefly refer to other recent discoveries which affect our knowledge of the disease.

MOSQUITO VECTORS

The use of laboratory animals has enabled experiments to be carried out with a large range of mosquitos. Many species of *Aëdes* have been proved to be potential vectors. Practically, the important facts have emerged that *Aëdes aegypti* is the common vector, but that in West Africa *Aëdes univittatus* (Sugens) and *Taeniorrhynchus africanus* —both common domestic mosquitos—are also potential carriers.

PATHOLOGY OF THE DISEASE

The work of Klotz[9] has clarified our knowledge of the pathological findings in yellow fever, and has freed the pathology of the disease from the confusion caused by mistaken diagnosis of epidemic jaundice. The typical mid-zonal necrosis of yellow fever has been used in Brazil for an epidemiological study of the distribution of the disease, modified post-mortem examinations being carried out by means of an ingenious apparatus known as a viscerotome, by which a small portion of liver tissue is removed through a stab wound in the chest wall.

The work of Torres,[10] and, later, of Cowdry and Kitchen,[11] further identified yellow fever among the diseases caused by filterable viruses by describing cell inclusions in the liver cells comparable to the inclusions found in other virus diseases.

YELLOW FEVER AS REPORTED FROM WEST AFRICA IN RECENT YEARS

In dealing with the distribution of cases of yellow fever which have been notified in recent years I shall touch only upon the West African cases, and shall not mention the occurrence and distribution of the disease in South and Central America. During 1931 cases have been reported from Senegal (Ivory Coast), Haute Volta (French Sudan), and Dahomey among the French Colonies, and from the Gold Coast and Nigeria in the British Colonies, and the striking fact about the incidence of these cases is the exceedingly wide distribution and the occurrence of cases far in the interior. The disease has in fact not been a coastal disease. In recording the incidence of yellow fever in West Africa it must be emphasized that the European is merely the indicator—hundreds of cases must occur among Africans which are not recognized, and the number of cases which occur in Europeans depends more upon the degree of segregation of Europeans in residential areas than upon the actual incidence of the disease among the African population. The disease in Africans may be a serious illness, but it may be, and usually is, a trivial illness occurring in infancy. The typical highly virulent strain, now known as the "asibi" strain, was recovered from an African patient who had only transitory fever, headache, and pain in the back, only a trace of albumin on the second day of illness, and none subsequently. In native infants the disease is particularly difficult to recognize, and I saw a case recently of a child of 6 months who had suffered from a long attack of jaundice and whose blood gave absolute protection against yellow fever. So difficult is it to recognize among the African population that I was recently informed by a highly efficient African

* Read in opening a discussion in the Section of Tropical Medicine at the Centenary Meeting of the British Medical Association, London, 1932.

doctor of wide experience that Africans do not contract yellow fever.

The occurrence of yellow fever among Europeans in places widely separated has always been difficult to explain unless we imagine a widespread native epidemic, and the protection test has lent support to the idea that these may occur with so low a mortality that they do not come to notice. Thus in 1931 two isolated cases of yellow fever occurred in the northern provinces of Nigeria, at and near Kaduna ; protection tests carried out among African children in the township showed only 2 per cent. positive, but in the surrounding pagan villages 83 per cent. of the population gave a positive protection test, and in the more sophisticated Hausa villages 29 per cent. of the population showed a positive protection test. It should be noticed that in the interior of West Africa the European is a less reliable indicator of the incidence of yellow fever than in the southern and coastal region, because, owing to Mohammedan custom, there is less intimate contact, both in business and in living, among the Africans and Europeans.

Protection Test Studies upon Endemicity and Epidemicity

The publication by Beeuwkes, Bauer, and Mahaffey[12] of a study of the endemicity of yellow fever in West Africa upon epidemiological factors with special reference to the protection test opened a new field for sanitarians in West Africa. In this work the authors suggested that the main endemic centres of West Africa might be found in the large towns of the south-west of Nigeria. Subsequent work by members of the Yellow Fever Commission has shown an enormously wide distribution of the disease, which may be due to an extensive area, or areas, of endemicity, or to a recent widespread epidemic. Many difficulties exist in the interpretation of protection test figures ; the test indicates whether or not the disease *has* occurred in a locality, and by testing a series of age groups whether it is being maintained from year to year. Whereas a high positive rate in adults with negative results in children suggests that an epidemic has occurred in the past but that the disease is not endemic, a high positive rate in both children and adults suggests either endemicity or a recent epidemic among a susceptible population. It is not possible to determine the actual current status, since blood can rarely be obtained from very young children ; moreover, in dealing with an African population, it is difficult to be certain that the donors of blood specimens have resided all their lives in one area.

The Yellow Fever Commission has concentrated upon Nigeria in performing protection tests, but has carried out series of tests from the Gold Coast and from Freetown. Although some 2,000 serums have been tested the work is at present so incomplete that I do not feel justified in accepting the most courteous offer of Dr. Beeuwkes, the director of the Commission, to publish the figures which he has placed at my disposal. Beeuwkes, Bauer, and Mahaffey[12] pointed out that upon epidemiological factors the south-west section of Nigeria must be regarded as an important endemic area owing to the closely associated large towns, which contain exceedingly high populations for African towns, as will be seen from the following population figures: Ibadan, 234,000 ; Lagos, 144,000 ; Ogbomosho, 85,000 ; Iwo, 54,000 ; Abeokuta, 53,000 ; Oshogbo, 51,000 ; Oyo, 40,000.

Protection test figures obtained by these workers supported the conception that this area is an endemic centre of the disease, but recent figures obtained from other parts of Nigeria make it unsafe to assume that this section is the only, or even the main, endemic focus of the disease. It should be noted that the occurrence of the few reported cases of yellow fever in Europeans in Nigeria during 1931 has been supported by finding mild cases among Africans, as at Mamfe in the Cameroons, where a high proportion of these cases gave positive protection tests, or by finding a high protection test figure in the surrounding population among which no cases of the disease had been recognized, as at Garkida in Adamawa Province, and at Kaduna.

The unexpectedly high protection test rate in both children and adults which has been found in widely separated areas in Nigeria points, however, to the possibility of a recent extensive epidemic. In this connexion it is of interest to find that Gumel, a town upon the extreme northern border of Nigeria, gave a positive rate of 60 per cent. among twenty-five adults tested and of 44 per cent. in twenty-five children tested, whereas Sokoto, in the north-west, gave negative results in twenty-five children tested.

Admittedly the study carried out by the Yellow Fever Commission by means of the protection test is as yet too incomplete to enable reliable conclusions to be drawn, and a far wider study in Nigeria and in other colonies must be carried out before we can obtain a clear picture of the situation. The important fact which has been brought to light is that the disease has been exceedingly widespread in the African population, even in the dry northern belt, and in view of the distribution of reported cases of the disease throughout the hinterland of West Africa we may suppose that this situation has been almost universal.

Infectibility of the Dry Northern Part of the Hinterland

Apart from isolated cases of yellow fever which have occurred from time to time in the northern provinces of Nigeria we now have the evidence of the protection test to show that the disease may exist in epidemic form, or even possibly in endemic form, among the African population of the dry northern country. Generally speaking, towns are far apart, and are of no great size, so that conditions would not appear to be favourable for endemicity, but towns are connected by scattered hamlets, and weekly markets attract large attendances, so that " regional " or " circulating " foci of endemicity may exist. If such areas were free from the mosquito vector during part of the year a true endemicity could not exist, but I shall show that the vector is actually present, though in reduced numbers, throughout the dry, cold season. To a traveller in the extreme northern section of Nigeria in the cold harmattan season the country appears desiccated and entirely unfavourable for an *Aëdes* population, but even in this season the temperature is high during part of the day, and the shortage of water leads to storing in innumerable earthenware water-containers in towns and villages. The following table shows the meteorological conditions of this northern belt during 1931:

	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.
Kano: absolute max.	100	110	108	109	105	100	97	92	93	100	93	99
„ min.	51	54	64	72	71	68	67	68	67	58	56	54
Mean ...	75	79	85	91	89	83	79	79	79	80	73	74
Relative humidity	25	21	24	48	58	73	81	82	80	53	30	24
Rainfall in inches	—	—	—	0.73	1.72	5.40	14.53	15.14	8.87	0.09	—	—
Katsina: absol. max...	95	104	107	108	105	108	93	92	92	99	93	96
„ min...	52	53	61	70	66	67	65	64	62	61	59	54
Mean ...	76	78	83	92	89	84	81	80	80	80	79	75
Relative humidity	22	18	28	39	55	71	80	93	83	37	28	45
Rainfall in inches	—	—	—	0.17	3.80	3.15	6.17	5.40	6.41	—	—	—

The *Aëdes* population of Kano and Zaria has been studied by the members of the Yellow Fever Commission, who made careful surveys of those towns at four seasons throughout the year—that is, during the hot, dry season before onset of rains, during mid-rains, during the hot period after rains finished, and during the cold, dry harmattan season. At the same time a study was made by A. W. Taylor, entomologist attached to the Tsetse Investigation at the Tsetse Camp at Gadau, also in the dry belt, working in co-operation with the Yellow Fever Commission, who made similar surveys of a typical village (afterwards proved by the protection test to have suffered from yellow fever), and carried out longevity experiments with local and coastal species of *Aëdes* kept at room temperature and in a moist chamber. The results of these surveys and experiments will be published in due course. Briefly the high larval *Aëdes aegypti* house index of 69 and 34 for Zaria and Kano respectively in the wet season fell to 45 and 24 in the hot, dry season, and was still as high as 22 and 16 during the severe cold harmattan season. Similarly, the percentage of adult *Aëdes* caught per room varied in Zaria and Kano respectively from 0.8 per room and 0.4 per room in the wet season to 0.4 and 0.2 per room in the dry, hot season and 0.2 and 0.04 during the harmattan season. At the small village near Gadau the room index for adult *Aëdes* was still as high as 0.7 during the severe harmattan season. The longevity of *Aëdes* was shown by Taylor to depend more upon temperature than upon humidity. No experiments have been made upon the infectibility of *Aëdes* with yellow fever virus during the cold harmattan season, although this factor may be of some importance epidemiologically. It has been shown by the Nigerian Tsetse Investigation that temperature plays an important part in the infectibility of *Glossina* with *Trypanosomum gambiense*.

We must conclude, therefore, upon the evidence now available that the dry northern country is both infectible and is possibly able to maintain infection throughout the year, and evidence has been given to support the view that a widespread epidemic has occurred recently. That such an epidemic can occur, and can be unrecognized among the African population, except in rare cases, is of supreme importance in the framing of quarantine regulations.

Quarantine Regulations, with Special Reference to the New Factor of Air Services

Many years' work will be required throughout the whole of West Africa on the protection test before we can form a definite opinion, upon the evidence of this test, as to the main endemic areas in West Africa, and repeated tests upon age groups will be necessary to avoid the confusion between the condition of endemicity and that caused by a recent epidemic in a susceptible population. In the meantime, we must regard the whole of West Africa as potentially infected at any time, and must remember that this infection may escape notice. Any quarantine regulations based upon reported cases of the disease, or upon known areas of endemicity, can only lead to a false sense of security.

Quarantine regulations for aircraft have been tentatively drafted upon a basis of known endemic areas. In my opinion this is impracticable at present, and ignores the possibility of widespread and unrecognized foci of disease elsewhere between the coast and the Sahara, all of which country is infectible. It has been suggested that all aerodromes in endemic areas should be " anti-amaryl, ' which entails complete mosquito protection of all houses, isolation from native towns, residence of passengers for six days in the aerodrome before leaving for infectible countries, and the provision of complete medical and pathological equipment. As it must be agreed that unrecognized infection is more dangerous than known infection, it is obvious that no other aerodromes than anti-amaryl aerodromes could be used throughout West Africa. Upon the grounds of expense and of delay caused to intending passengers this would be impracticable, and if air services from West Africa to infectible countries are to eventuate a compromise must be made. I would suggest for consideration the following general plan for West Africa:

1. Continuation and extension of the system, already partly practised in British Colonies, of the segregation of Europeans within European residential areas

2. Aerodromes to be confined to the neighbourhood of such European residential areas as are associated with native towns under close sanitary control. Such areas could be designated " sanitary areas."

3. Intensification of sanitary measures in both the residential areas and native towns mentioned in (2).

4. Aerodromes to have efficient disinfecting plant for baggage and suitable accommodation for medical inspection of passengers.

5. The success of sanitary measures to be checked by making detailed *Aëdes* surveys of the " sanitary area " and by making protection tests upon young children from time to time. The results to be communicated to a central committee, such as that of the Bureau d'Hygiène.

6. Sanitary authorities in infectible countries to bear the responsibility of examining passengers and crew arriving from West Africa and of keeping them under (ambulatory) surveillance for six days from the date of their departure from West Africa unless they carry a certificate of residence in a " sanitary area " for the required time before departure.

Such action and regulation would, I think, cover the immediate risk while air services are limited and are used almost exclusively by European passengers. I have stressed the importance of the principle of European residential segregation, as experience has proved how rarely an infection has occurred in a European resident in such an area. I suggest that, as a possible development before air services become numerous, a system of protective vaccination of crew and intending passengers may have been worked out upon a practicable basis. The use of a formalinized vaccine as described by Hindle[13] has not been uniform in results, and has been abandoned for the mouse-brain virus, which has lost its power to kill monkeys, but which, as a measure of precaution, is given with a large dose of convalescent serum. The technique and results of this method have been described by Sawyer, Kitchen, and Lloyd,[14] and the vaccine is satisfactory in conveying protection, but the large quantity of convalescent serum which is required, and the risk that active virus may be present in the circulation while protective bodies are being formed, makes the method as now developed only practicable of application to laboratory workers who are particularly exposed to infection.

Control of the Disease in Infected Countries

Whatever methods are used for protection of non-infected but infectible countries as an emergency measure owing to the development of rapid air service, it is obvious that the disease must also be vigorously attacked at its source with a view to final eradication. In West Africa improvement of sanitation must be of gradual development among the African population, and can never be truly effective until the population has developed a health sense. Direct sanitary control under the supervision of a European staff is impossible, except in localized centres, in a country of the size of Nigeria, for instance, with its population of over 19,000,000 people. Moreover,

the accepted principle of indirect rule involves the education of the chiefs and people to develop their own service—political, educational, and health—under the advice and guidance only of the European staff, and direct action taken by an energetic European sanitary staff in a native city may entirely destroy the delicate growth of a system of responsibility thrown upon chiefs, sub-chiefs, ward heads, and family heads, quite apart from the inherent difficulties of house inspection among a Mohammedan population. It must also be realized that a campaign against yellow fever alone will receive small support from a native population which is not impressed with the seriousness of the disease, and that the medical authorities in West Africa must face such serious diseases as smallpox, yaws, sleeping sickness, relapsing fever, leprosy, guinea-worm, and schistosomiasis, for the control of which organized campaigns undertaken by survey parties followed by treatment parties are necessary. Some 56,000 cases of yaws alone are being treated each year in Nigeria, and between 5,000 and 10,000 cases of sleeping sickness. An enormous expansion of health work among the population is taking place in West Africa, and in Nigeria this is becoming more and more effective through the native administrations, which are now entirely supporting eight large hospitals and 140 dispensaries, and are producing well-educated candidates for training as sanitary inspectors, dispensers, and medical assistants. Native administrations are also becoming more and more anxious to install pipe-borne water supplies into their cities.

It will be generally agreed that the right way to attack yellow fever is to improve general sanitation and to educate the local population. The programme which we are attempting in West Africa is upon the following lines:

1. Institution of pipe-borne water supplies.

2. Education in hygiene by means of hygiene lectures in schools, health weeks, and newspaper articles.

3. Education and training of African sanitary and medical personnel.

4. Dissemination of trained African staff throughout the country by establishment of scattered dispensaries, which will finally develop into rural and urban health centres.

In conclusion I must pay tribute to the work of the Yellow Fever Commission of the Rockefeller Foundation in West Africa. The value of the work which the members of that Commission have carried out is fully recognized from the papers they have published, but the appreciation of the West African Medical Service is also due for the charming contact which they have made with us, for their most ungrudging help and advice, and for the open manner in which they have placed at our disposal the results of their work. I am myself particularly indebted to the director of the Commission, Dr. Henry Beeuwkes, and to Drs. Mahaffey and Bauer, and I recall with immense pleasure a journey which I took with Dr. F. F. Russell, the director of the Health Division of the Rockefeller Foundation, through Nigeria early in 1931, and the hospitality of the Foundation to me upon a visit to America as their guest in 1930.

REFERENCES

[1] Sawyer: *Medicine*, 1931, x, No. 4.
[2] Stokes, Bauer, and Hudson: *Amer. Journ. Trop. Med.*, 1929.
[3] Mathis, Sellards, and Laigret: *Comptes rend. Acad. de Sci.*, 1928.
[4] Aragao: *Journ. Amer. Med. Assoc.*, 1929.
[5] Davis and Burke: *Journ. Exper. Med.*, 1929.
[6] Sawyer, Kitchen, Frobisher, and Lloyd: Ibid., 1930.
[7] Theiler: *Ann. Trop. Med. and Parasitol.*, 1930.
[8] Sawyer and Lloyd: *Journ. Exper. Med.*, 1931.
[9] Klotz and Belt: *Amer. Journ. Path.*, 1930.
[10] Torres: *Comptes rend. Soc. Biol.*, 1928.
[11] Cowdry and Kitchen: *Amer. Journ. Hyg.*, 1930.
[12] Beeuwkes, Bauer, and Mahaffey: *Amer. Journ. Trop. Med.*, 1930.
[13] Hindle: *British Medical Journal*, 1928.
[14] Sawyer, Kitchen, and Lloyd: *Proc. Soc. Exper. Biol. and Med.*, 1931.

COLLES'S FRACTURE*

BY

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A simple and useful classification of fractures of the lower end of the radius is to be found in the admirable monograph on injuries of the wrist by Etienne Destot of Lyons, published in 1923.[1] Destot, who was one of the pioneers in radiology in France, divided these fractures into two main groups: (1) *anterior fractures*, which include three distinct types of injury—(*a*) fracture of the radial styloid process, (*b*) anterior marginal fractures, and (*c*) the so-called reversed Colles or Smith's fracture; (2) *posterior fractures*, consisting of (*a*) the classical Colles, or, using the French terminology, the Pouteau-Colles fracture, and (*b*) the posterior marginal fractures. In this group the term Colles's fracture embraces also the equivalent injury in early life—namely, separation of the lower epiphysis of the radius.

Among these several types of injury, Colles's fracture occupies a position of outstanding importance, not merely because of its frequency, but because of the special mechanical difficulties which may be encountered in its treatment, and the disastrous results which may follow the neglect of fundamental principles. As an indication of the comparative incidence of Colles's fracture in fractures of the lower end of the radius as a whole, figures may be quoted from the fracture clinic of my surgical unit at the Ancoats Hospital. During a five-year period a consecutive series of 835 recent fractures of the lower end of the radius was made up of the following: Colles's fracture (including the reversed Colles), 571; separation of the radial epiphysis, 174; styloid and marginal fractures, 90.

HISTORY OF COLLES'S FRACTURE

On the occasion of a centenary meeting, and with a subject for discussion of great antiquity, I believe it is appropriate to interpolate some reference to the history of the evolution of our knowledge concerning Colles's fracture. Until the middle of the eighteenth century this injury was universally regarded as one of the forms of dislocation of the wrist-joint. Thus, in 1726, we find J. L. Petit[2] writing on luxations of the wrist, and emphasizing two characteristic sequels: (*a*) limitation of pronation and supination (due in his view to injury to the triangular fibro-cartilage), and (*b*) undue prominence of the lower end of the ulna. It remained for another French master surgeon, Claude Pouteau[3] of Lyons (1735–75), some thirty years later, to describe for the first time the common fracture of the lower end of the radius. Pouteau's description appeared in 1783 in his *Oeuvres Posthumes*, and no further reference to this injury can be discovered in French surgical literature until a generation later with the advent of Dupuytren (1777–1835). It is interesting to note that Dupuytren's career in Paris coincided almost exactly with that of Abraham Colles in Dublin. But in Dupuytren's famous clinical lectures,[4] published just one hundred years ago, in a masterly exposition of fractures of the lower end of the radius there is no mention of the article written by Colles[5] in 1814, in which the Dublin surgeon believed that he had described a lesion hitherto unrecorded.

If we may judge from contemporary surgical literature Colles's paper attracted comparatively little notice for

* Read in opening a discussion in the Section of Orthopaedics at the Centenary Meeting of the British Medical Association, London, 1932.

many years. But a surgeon of his eminence, with a practice which in 1826 brought him in an income of £6,128, must have taught and demonstrated on numerous occasions the diagnosis and treatment of the fracture which was later to bear his name. In 1847, three years after the death of Colles, Smith[6] of Dublin placed on record his observations on the anatomy and mechanism of this fracture. Smith was one of the first to recognize and describe the characteristic triple displacement of the lower fragment. His contribution is also notable in that it contains an account of the rare fracture in which the lower fragment is displaced forwards—the reversed Colles—now generally known as Smith's fracture. The question of impaction evidently loomed large in the minds of the older surgeons, and much space is devoted by Smith to an elaborate argument proving that true impaction was not the rule in Colles's fracture. Twenty-seven years later, E. H. Bennett[7] of Dublin, professor of surgery in Trinity College, after dissecting fifty-four specimens concluded that impaction was a constant feature when comminution was present. (Bennett's views were presented at the annual meeting of the British Medical Association in Cork in 1874.)

At this stage our indebtedness to the Irish school of surgery became further increased by the appearance in 1875 of a monograph by Alexander Gordon[8] of Belfast. Gordon's work on this subject is one of the outstanding contributions in any language, and can be read with delight and profit by the surgeon of to-day. Gordon's views on the mechanism of production of the fracture—namely, forced hyperextension of the wrist exerting a cross-breaking strain on the lower end of the radius—have, with certain reservations, remained unchallenged. On the vexed question of impaction Gordon, as a true son of Belfast, joined issue with his Dublin colleague Bennett, and proved to his own satisfaction that impaction was a mechanical impossibility. With the advent of radiology this academic controversy ceased to occupy the foreground in the literature on Colles's fracture. In recent years, however, the subject was once more reopened by Stevens[9] of Boston, who has put forward the view that the fracture is a true compression injury in which there is a crumpling of the posterior cortical surface without any actual telescoping of the fragments.

Before leaving this short historical digression it is fitting that I should remind you that in 1885 a young Liverpool surgeon[10] presented an analysis of 105 cases of Colles's fracture treated by him personally. This is the second, in chronological order, of the long sequence of contributions to surgical literature made by the president of this Section, Sir Robert Jones. In reading his paper one gains the impression that at an early stage in his career he knew everything there was to be known about Colles's fracture. At that time he was already practising the method of reduction by direct force applied to the bony fragments, and for the control of the fracture he advocated the use of metal gutter-splints rather than the popular splints of the day.

ANATOMY AND MECHANICS OF THE FRACTURE

It is unnecessary for me to embark upon a detailed exposition of the anatomy and mechanics of Colles's fracture. There are, however, certain points which cannot be stressed too often. Though traditionally a fracture of elderly females, the injury is common in both sexes at earlier periods of life. In the majority of cases the fracture results from a fall on the outstretched hand. The line of fracture is transverse and lies within an inch of the articular surface of the radius, at a site where, for architectural reasons, the bone is ill fitted to resist a powerful cross-breaking strain. Gross displacement reproducing the dinner-fork deformity so beloved of the textbooks is relatively uncommon. But, as judged from the figures of my own fracture clinic, some degree of displacement appreciable either by clinical or by radiographic examination is present in not less than 75 per cent. of Colles's fractures dealt with in the routine of hospital casualty practice. This fact is deserving of greater emphasis in the teaching of students and in the instruction of hospital residents.

The classical triple displacement of the lower fragment calls for no elaborate description (Fig. 1). It must be remembered, however, that both radial displacement and backward displacement *en masse* may be absent. The essential deformity then consists of a backward tilt, which in its most extreme degree reverses the plane of the lower articular surface of the radius. This simple mechanical schema is somewhat modified in the comminuted fractures in which there are a direct implication of the wrist-joint itself by secondary lines of fracture and the independent displacement of one or more large fragments (Fig. 2).

The relation of the fracture to the inferior radio-ulnar articulation must also be considered. In 50 per cent. of cases the fracture line on the mesial aspect reaches the upper limit of the articular surface for the head of the ulna, or actually traverses this articular facet. Involvement of the radio-ulnar joint in this manner, in my opinion, has little or no ultimate bearing on the function of rotation of the forearm. Of more serious import is the disturbance which may result from a fracture of the styloid process of the ulna through its base, or its mechanical equivalent—detachment of the triangular fibro-cartilage. It is difficult to establish the frequency of the latter injury *per se*, as unmistakable clinical signs of separation between the lower ends of the two forearm bones are rarely demonstrable. This is a point in the anatomy of Colles's fracture which has exercised the minds of surgeons for many generations. When the ulnar styloid is fractured towards its tip by traction via the internal lateral ligament, the inferior radio-ulnar joint is not directly involved (Fullerton [11]).

DIAGNOSIS

In the presence of marked deformity and obvious crepitus the clinical diagnosis of a Colles fracture is a simple matter. But minor degrees of displacement—particularly the backward tilt, or radial deviation—are rapidly obscured by the haematoma which collects around the fracture line after a few hours. Crepitus, moreover, is an inconstant sign, not necessarily because of true primary impaction—which may undoubtedly occur—but because in many fractures the distal fragment is simply rotated backwards as on a hinge. To the practised eye and finger the loss of the normal anterior concavity of the lower end of the radius, which is a measure of the backward tilt, is sufficiently striking. We cannot stress too often the importance of this physical sign. But for the ultimate diagnosis, as well as for the exact details of the anatomy of a Colles fracture, we must enlist the aid of radiography. At the present time it should hardly be necessary to warn the members of our profession that to undertake the diagnosis and treatment of any injury of this type without radiographic control is to court disaster.

TREATMENT

Anaesthesia

Although it is physically possible for an expert fracture surgeon to reduce the average Colles fracture shortly after the accident without anaesthesia, in routine practice an anaesthetic should invariably be used. Nitrous oxide is adequate for the majority of patients, but in older, frail individuals who are often the victims of this injury,

general anaesthesia is sometimes open to serious objections. The improvement in the technique of local anaesthesia for the reduction of fractures, which we owe largely to Lorenz Böhler, has provided us with an alternative method particularly suitable in Colles's fracture. In my own hospital clinics I have been slow to appreciate its advantages and effectiveness, but I now regard it as a valuable addition to one's armamentarium. When the technique has been mastered the method is most attractive ; the fracture can be reduced and fixed in leisurely fashion with little or no discomfort to the patient. From my own experience, which is still limited, the ideal conditions for local anaesthesia are a fracture of some hours' duration, presenting a haematoma on the dorsum of the wrist into which the 2 per cent. novocain can be easily and rapidly diffused through a single puncture. I find it more difficult to anaesthetize a " dry " fracture before the haematoma is fully developed, or at a much later stage when the haematoma has disappeared and the soft tissues are becoming matted together. In neglected fractures some days old, where unusual or prolonged force may be necessary in reduction, a general anaesthetic is always desirable.

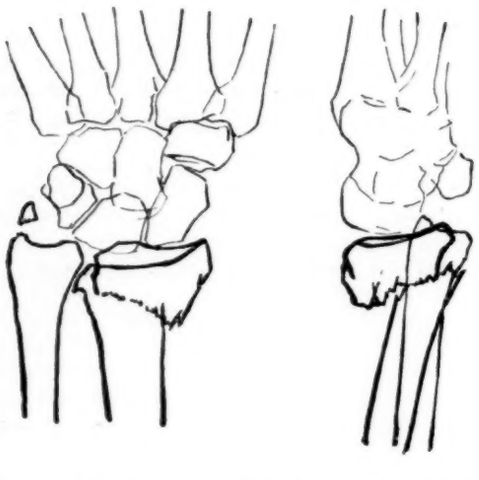


FIG. 1.—Colles's fracture. Female, aged 63. Showing triple displacement.

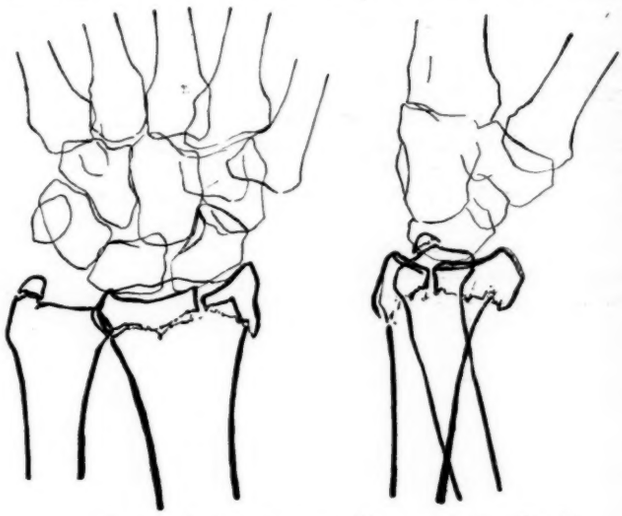


FIG. 2.—Colles's fracture. Male, aged 41. Showing comminution.

Reduction

The reduction of the primary displacement by force applied directly to the bony fragments, as taught by Sir Robert Jones, is a method which has gained almost universal acceptance in this country. By this manœuvre the common deformity—that is, backward rotation of the lower fragment—can be corrected with absolute precision. We hear little nowadays of the old hand-shaking method in which traction alone was used as the reduction force. I would suggest, however, that traction is a valuable adjunct in certain phases of reduction. In my own practice, I use it (*a*) as a preliminary manœuvre, combined with hyperextension of the wrist in order to disengage the lower fragment ; and (*b*) in the last stage, combined with palmar flexion and adduction of the hand to overcome radial deviation after the backward tilt has been corrected by direct pressure. The chief clinical test of an effective reduction is a restoration of the normal anterior curvature of the lower end of the radius. The accuracy of the reduction, however, must be demonstrated in radiograms in two planes. It must be realized that the backward rotation is completely corrected only when the lower articular surface of the radius once more looks downwards and forwards. (Fig. 3.)

I believe that the force required to effect the reduction of a *recent* Colles fracture is contained in the average pair of hands. I can therefore see no indication for the method of reduction over a wedge, as advocated a few years ago by my friend Blundell Bankart[12] in a provocative communication which tempted the president of this Section to engage in a friendly controversy on this point.[13] The problems of manipulative reduction in neglected fractures are of course entirely different. Great force is now required to disengage the fragments and to overcome deformity ; in this effort a wedge or the Thomas wrench may be indispensable, but these weapons are dangerous except in the hands of an expert.

Fixation

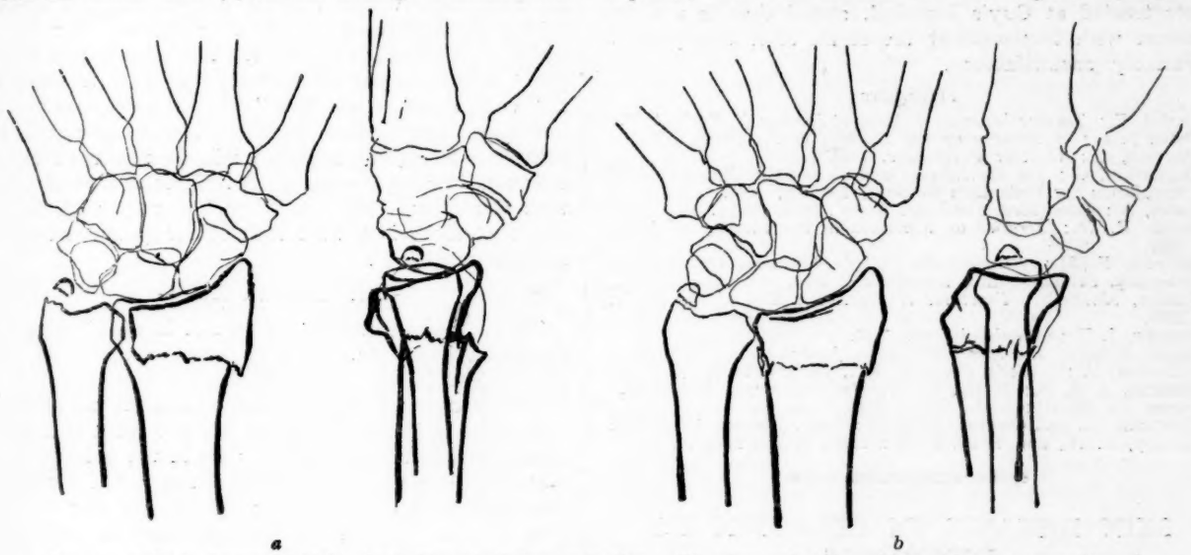
It has often been said that the method of fixation of a Colles fracture is of secondary importance to accurate reduction. In the writings of some of the older surgeons already quoted there is scanty reference to the details of the actual reduction. It would appear that splints of a special type were often expected to overcome the primary deformity. Thus, Gordon used a splint of his own design which aimed at restoring the form of the lower end of the radius. It is a striking fact that many, in fact the majority, of the " special " splints introduced for the control of this fracture by surgeons of repute in their own generation have been mechanically ineffective. It is obvious that the natural position for fixation of the limb after reduction is with the wrist in slight palmar flexion and the hand somewhat adducted. It thus follows that the essential principle in splinting is the control of the extensor aspect of the forearm, wrist, and dorsum of the hand as far as the metacarpo-phalangeal range. Splinting of the flexor surface of the forearm and wrist, though desirable in some fractures, is of subsidiary importance ; and, indeed, an anterior splint inaccurately applied may tend to thrust the lower fragment back into the position of deformity.

No splints, ancient or modern, can compare with the gutter splints of light metal, permeable to *x* rays, twisted after the method of Sir Robert Jones, and used in conjunction with two controlling pads. As an alternative method of fixation plaster-of-Paris offers many advantages, and, as Böhler has proved, is particularly suitable in a busy hospital fracture clinic. In this method the fracture is controlled by a posterior plaster strip applied directly to the skin of the extensor surface of the forearm, wrist, and hand as far as the knuckles. The plaster gutter embraces two-thirds of the circumference of the limb, is accurately moulded over the lower end of the radius, and trimmed to allow free mobility of the thumb. In many fractures the posterior plaster gutter alone

suffices, but as an additional safeguard an anterior plaster strip is useful. In fractures which are relatively unstable after reduction the position of extreme palmar flexion of the wrist has been advocated from time to time. Although I have felt compelled to use this position on rare occasions as a temporary expedient, I believe that it represents a confession of failure to obtain that free disentanglement of the lower fragment which is necessary for accurate reduction of the displacement.

Mobilization

Conflicting views are held regarding the length of time during which a Colles fracture should be completely fixed by splints or plaster and the stage at which physio-therapeutic treatment should be introduced. It will be generally agreed that fractures without displacement can be treated with impunity by a short period of fixation and by early mobilization of the wrist and inferior radio-ulnar joints. On the other hand it has been established beyond all doubt that (*a*) in the average fracture with displacement firm consolidation rarely takes place before the end of the fifth week ; and that (*b*) in certain circumstances in a fracture well reduced the original deformity—and more particularly the backward tilt—is liable to reappear during the first three weeks. Thus the frequent removal of splints during the period of fixation for the purposes of physio-therapeutic treatment is likely to be a hazardous procedure. The question therefore arises as to how far the ultimate functional results are influenced by the employment of physical treatment in the early stages. On this point I believe that my experience has enabled me to form an unprejudiced opinion.



a *b*

FIG. 3.—Colles's fracture. Male, aged 52. (*a*) Before reduction ; (*b*) after reduction. Note accurate correction of backward tilt.

For a number of years in my own hospital clinic it was the routine to begin light massage to the limb at the end of the first week. The treatment was given under water in an arm bath with the fracture carefully supported by pressure applied directly over the fragments. Active movements of the wrist-joint in the direction of palmar flexion only were allowed after the tenth day, and rotation of the forearm towards the end of the third week. After each sitting the splints and controlling pads were accurately reapplied. These cases were entrusted only to senior students of the massage school, acting under continuous supervision. On the whole I found little cause for dissatisfaction with the standard of functional results obtained under this regime. But it became obvious that this method of handling such a common injury as Colles's fracture, though providing valuable training for the students in the massage school, consumed far too much time and energy, and was frankly uneconomical. Further, in spite of the most careful supervision, from time to time I was confronted with cases of recurrent deformity after reduction—a contretemps usually discovered in the third week. For the past three years I have entirely eliminated active physio-therapeutic measures during a period of fixation which lasts five weeks ; and, afterwards, only those patients who are likely to be slow in obtaining full mobilization by their own unaided efforts are treated in the massage department. But during the fixation stage the injured limb is by no means regarded as an idle appendage. After the first day the patient begins a definite scheme of activity which embraces all the joints of the upper extremity except those temporarily immobilized—that is, the wrist and radio-ulnar joints. This plan, which is based on the practice of Böhler, is most easily followed out when the fracture is securely controlled in an accurately fitting plaster splint which cannot be displaced. For the greater part of this time no sling is required, and the freedom of the fingers, elbow, and shoulder allows the patient to use the limb for many domestic or professional duties.

It has thus been possible for me to make a comparison between the two popular methods of treating Colles's fracture. I am compelled to conclude that nothing has been lost by the elimination of early physio-therapeutic treatment ; that the risks of recurrent deformity have been minimized ; and that in the average fracture treated by plaster fixation for a period of five weeks the nutritional condition of the limb at the end of that time is, if anything, better than in a similar fracture treated by physio-therapeutic measures from the second week onwards.

RESULTS OF TREATMENT

With the improved organization for the handling of fractures which now exists in many of our leading hospitals it is becoming increasingly possible to inquire into the late results of the treatment of any particular group of fractures. Some three years ago the subject of Colles's fracture was admirably presented from this aspect by Edwards and Bellis Clayton[14] of King's College Hospital, who were able to collect from a questionary information relating to 321 fractures of this type. The functional results obtained in this series were classified as follows: Perfect results, 235 or 73.2 per cent. ; good results, 74 or 23.1 per cent. ; bad results, 12 or 3.7 per cent.

These figures may be taken as representing the standard of results achieved in a special fracture service with unity of surgical control. In my own clinic, in 111 patients of

the 1925–28 series, who reported for examination two to five years from the date of the injury, the findings are somewhat similar.

Result	Fractures without Displacement	Fractures with Displacement
Excellent (including perfect)	18	74
Good—that is, able to do original work, but some slight objective or subjective defect	6	10
Poor	—	3

I agree with Edwards and Clayton that pre-existing arthritis of the wrist is a not uncommon factor in influencing the type of end-result. Furthermore, apart from gross malunion, following comminution, I believe that the late development of arthritic changes in the wrist or inferior radio-ulnar joints as a direct sequel of Colles's fracture is absolutely exceptional. These results go far to controvert the surprising conclusions presented in 1929 by Grasby and Trick,[15] who, after an examination of fifty cases treated at Guy's Hospital, stated that in a Colles fracture with displacement the result after two years is invariably unsatisfactory.

REFERENCES

[1] Destot, E.: *Traumatismes du Poignet et Rayons X*, Paris, 1923.
[2] Petit, J. L.: *A Treatise on the Diseases of the Bone*, 1726.
[3] Pouteau, C.: *Oeuvres Posthumes*, 1783.
[4] Dupuytren, G.: *On the Injuries and Diseases of Bones* (English translation for Sydenham Society), London, 1846.
[5] Colles, A.: *Edin. Med. and Surg. Journ.*, 1814, vol. x.
[6] Smith, R. W.: *Treatise on Fractures in the Vicinity of Joints*, 1847.
[7] Bennett, E. H.: *Remarks on Colles's Fracture*, etc. (Annual Meeting, British Medical Association), 1874.
[8] Gordon, Alexander: *Fractures of the Lower End of the Radius*, 1875.
[9] Stevens, J. H.: *Annals of Surg.*, 1920.
[10] Jones, Robert: *Liverpool Med.-Chir. Journ.*, July, 1885.
[11] Fullerton, A.: *Colles's Fracture*, etc., Belfast, 1905.
[12] Bankart, A. S. B.: *British Medical Journal*, March 16th, 1929.
[13] Jones, Sir Robert: Ibid., March 30th, 1929.
[14] Edwards, H., and Clayton, E. Bellis: Ibid., January 12th, 1929.
[15] Grasby, E. D., and Trick, S. R.: Ibid., March 2nd, 1929.

SKIN DISEASES IN RELATION TO INDUSTRY*

BY

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The recent death of Sir Thomas Legge has removed from English medicine a remarkable man whose contributions to the preventive side of dermatology have been a noteworthy event in the yearly reports of the Chief Inspector of Factories. His contributions to this special branch of medicine occupy a column and a half in the index of Prosser White's monumental and invaluable *Occupational Affections of the Skin*,[1] and the latter states that most of the improvements in English statutory laws for a stricter enforcement of welfare and precautionary measures are due to the initiative of Sir Thomas Legge. That the State is properly concerned in every aspect of occupational disease—preventive, curative, and financial—is sufficiently evinced by the Home Office estimate of 1932 in that, making every allowance, the total charge to all industries and employments under the Workmen's Compensation Acts and the Employers' Liability Act of 1880 would be something over twelve million pounds.

STATISTICS

Cases of dermatitis in the workmen's compensation statistics of compensation in certain occupations have steadily grown from 270 in 1919 to 1,802 in 1930,[2] occurring in a great variety of industries, but chiefly among bakers and confectioners, dye workers, french-polishers, and engineers. Certifying and appointed surgeons gave 1,938 certificates of dermatitis produced by dust or liquids in 1930, and refused 349. It is hardly realized how powerful these certificates are. If unchallenged speedily, the surgeon's opinion becomes a legal fact, and however strongly developments of the case may show him to have been wrong, his opinion in the hands of the courts is binding against the evidence of most competent, but later, dermatologists. There were, in addition, forty-four cases of ulceration of the skin, produced by dust or liquids, ninety-seven cases of skin cancer, sixty-nine cases of chronic ulcer, twenty-seven cases of anthrax, and one case of " inflammation, ulceration, and malignant disease of the skin and subcutaneous tissues due to exposure to *x* rays or radio-active substances " similarly certified in 1919. This return may be expected to increase with growing public familiarity with the possibility of dermatitis and its causation, which induces a psychological condition arising from the ease with which allegations can be made which are difficult to disprove. There has arisen in recent years a type of patient who may be said to suffer from a " compensation complex," and the skin, as much as any other organ, can be afflicted with traumatic neurasthenia—an example of the will of a patient to suffer unless adequately compensated. It is not widely known that the Home Office is concerned only with factories, and that there is a wide field of occupational dermatitis outside its charge.

DERMATITIS IN THE HOME

The use of the term " industrial hazard," common in American literature, tends to obscure the issue, for in the modern home to-day the housewife is exposed daily to the unsupervised use of many and mixed skin "noxae."

An antithesis between home life and work and industry should not be allowed to grow up in the surgeon's mind. The town home is to-day a small chemical factory. Run through the pages of a stores catalogue and you will realize that what is made in the factory is used in the home by those with minds of all types and skins of all varieties of hygienic care and natural fragility. The home worker has her hands immersed in water for hours at a time; hot alkaline cleansing lotions are in frequent use; strong soaps and sodas, quick chemical cleansers, and even chloride of lime are employed to save time, while strong or dilute acids are used to clean lavatory basins and closet pans. Metal polishes, furniture polishes, leather preservatives, and metal pastes are sold extensively. Quick-drying enamels and paints, varnishes, special rapid paint renovators, storage batteries, disinfectants, insecticides, and artificial plant manures are in daily use.

I prefer, then, to use the term " exogenic dermatitis " to cover any dermatitis due to any sort of external irritant, and to name it if possible. The result of the application of external irritating agents to the skin over a long or short period of time is the appearance of a reaction varying in all degrees from an allegation of discomfort up to itching, smarting, or burning, and through stages of redness, punctate or confluent, up to a pustular, scaly, warty, or malignant ulcerative reaction. A very thorough treatment of this entire subject, but one which is unavailable in translation, is that by Ullman, Oppenheim, and Kille.[3]

CAUSATIVE AGENTS

Though the list is inexhaustible some classification of causal agents is called for. Prosser White published an extensive classification under thirteen headings at the International Congress on Industrial Accidents and Diseases, held in Amsterdam in September, 1925. A

* Read in opening a discussion in the Section of Public Health at the Centenary Meeting of the British Medical Association, London, 1932.

less critical division, however, should suffice, and I suggest four headings:

1. Mechanical or physical—abrasion, heat, cold, actinic and other rays.
2. Plants and their products—resins, wood dusts, lacquers, morphine.
3. Living agents—bacteria, fungi, mites,[4] filter-passing viruses.
4. Chemicals: (*a*) inorganic acids and salts; (*b*) hydrocarbons, oils, tar, pitch, anthracene; (*c*) dye products.

Physical Causes

Galloway[5] was, I think, the first to draw attention to lupus erythematosus due to exposure to hot sun amongst Thames watermen. Cases due to exposure have been acknowledged by the Ministry of Pensions, and if aggravation of lupus erythematosus by occupational exposure to cold or sun were brought to trial, the ambit of compensation would at once be considerably enlarged. *X*-ray workers in the medical profession are to-day well protected from *x* rays, but I have seen palsy and deep ulceration on the contact surfaces of index fingers of both hands in a woman who held three of her children's heads in position for complete *x*-ray epilation and so received fifteen times a safe dose.

Plants

A plant dermatitis of unusual recurrence in susceptible individuals is chrysanthemum dermatitis. Nurserymen suffer every October, and skin thus affected reacts so acutely that the experimental application of a chrysanthemum leaf to the back for twenty-four hours will produce a scarlet leaf on the skin that can be accurately photographed.[6] Pyrethrum belongs to this family of plants, and insecticides made from it will produce in the factory worker's hands (*a*) a vesicular eruption—the commonest; (*b*) a transient erythema; (*c*) a papular dermatitis; (*d*) an anaphylactic type with reddening of the face and an erysipeloid rash. Hop dermatitis, which occurred as a minor epidemic in my clinic in September, 1924, has not appeared for three years running. Probably climatic influences allow of great variation in the susceptibility of the worker's skin.

Chemicals

The acne plugs and indolent boils that form on the skin of engineers exposed to much lubricating or cutting oil are well known, but the incidence is falling off and the preventive measures strongly advised by Dr. J. C. Bridge, now Senior Medical Inspector of Factories, should be widely known. He states that oil dermatitis is emphatically preventable by the use of an "alkaline antiseptic wash such as the liq. sodae chlorinat. with boric acid (*B.P.C.*)." Its value is becoming known in many large engineering works, and is becoming the accepted method of removing oil effectively from the skin while disinfecting it at the same time.

DIAGNOSIS OF TRADE DERMATITIS

Dr. Overton,[7] with her wide official experience, stresses that an enormous number of cases of trade dermatitis are caused, not by the substances encountered at work, but by their removal by methods harmful to the skin. The french-polisher removes the stains arising from his occupation with soda-water of varying strengths (the stronger, the quicker the toilet) or with methylated spirit. Painters acquire skin disease, not from their paints, but from the use of turpentine or its synthetic substitutes. Alkalis in some form or other are always appearing as cleansers. Paraffin to remove grease from the skin takes its toll, together with other de-greasing agents such as turpentine, petrol, naphtha, acetone and its substitutes, and methylated spirit.

The long continuance of an alleged occupational dermatitis should make one very suspicious of its cause. The whole of the legal battle about these cases lies upon the words "due to." Dyson[8] says: "I recognize no difference between an eczematous trade dermatitis and eczema," and further, "the dermatitis occurs generally as a vesicular eruption between the fingers and on the hands simulating cheiropompholyx." I incline to a different view. With Sir Norman Walker, I hold that eczema is a term which has long been, and is still too commonly, applied to any wet or scaly inflammation of the skin, of the cause or nature of which the observer is ignorant. Each case must be unravelled extremely patiently, for the patient may be stupid, expectant, or malicious. "There is a distinct correlation between the local occurrence of cases of bakers' itch and the centres of trade union activity."[9] The time of the onset of symptoms must be ascertained precisely, for it may be due to a holiday sun exposure and not to work. Past treatment must be known, for the present may be a dermatitis medicamentosa. Susceptibility must be ascertained, as work that is harmless as a rule may be rendered hazardous after an attack of influenza. Again, the patient may present himself during a phase of urticaria of endogenous origin, or the attack may coincide with a seasonal exacerbation of a long-standing prurigo. An acid burn heals, a surgeon's cut heals—generally. One expects an alkali, a plant, or a sugar dermatitis to heal also. If, then, a case does not soon heal on its removal from its suspected cause, the aetiology may not be simple, but subtle. The real disease may be an anxiety neurosis with itching as a symptom, and work as work is bad for the patient's strained state, though it has not specifically caused his dermatitis, which is the product of rubbing and scratching with a "tic"-like persistence: a glove erythema of the forearms can be as truly neuropathic as the "stocking erythema"[10] that is widely known. I agree with Prosser White (loc. cit.) when he says traumatic dermatitis does not recur when the cause is removed and reasonable time has been allowed for it to heal. In idiopathic eczema recurrence is independent of known causes. Relapses may take place indefinitely. Particularly does this ruling apply to cases with a dyshidrotic history.

Patients who relate a clear story of pin-head irritating water blisters cropping out between the fingers—whatever they show to the examiner—are those who commonly take two to three years to recover. The cheiropompholyx is a reaction to a whole host of chemical, climatic, and emotional stimuli. It is a pattern or inborn type of skin reaction of the greatest frailty, and although each return to the original work may be followed by a new outcrop, it will be found that other and innocent work will produce an outcrop, and a patient healed in a hospital ward will relapse on the day arranged for his discharge. Work will increase the severity of an attack of cheiropompholyx; water and chemicals of all kinds will aggravate the irritation and remorseless scratching it receives, but if it be due to work in the sense of a *causa causans*, cure on removal will be speedy.

DYES

The chemical problems of dye dermatitis are of no clinical significance. O. Sachs,[11] after thorough investigation, showed that fuchsin is not poisonous, but that ill effects then reported were due to serious arsenical contamination common at the time. To us that would still be an exogenic dye dermatitis. Knowles[12] traces certain outbreaks to arsenic and chromium compounds in dyed garments. Weyl particularly incriminates dinitroresorcinol naphthol green, martis yellow, orange, metanil yellow, aurantia, sudan I, and naphthol black. It seems reasonable to hold that these dyes can only be active skin irritants if they are present in a free state, or so

loosely held in the material as to be transferable from the garment to the wearer's skin in sensible quantities by the action of moisture or sweat.[13] A dye or intermediate which is so well fixed, mordanted, or oxidized as to be insoluble or not transferable to the skin cannot be regarded as harmful. This explains the great freedom of tailors and garment makers of all kinds from occupational dermatitis.

Percival[14] demonstrated, using ursol containing *p*-phenylenediamine, that a normal person may fail to react to a 10 per cent. solution, whereas dermatitis cases react to concentrations varying from 0.005 per cent. to 0.5 per cent. This he considers to be due to an allergic state of the skin and to be idiosyncratic in nature. Who is to be held liable for idiosyncrasy? The worker or the employer, the dyer or the purchaser of a dyed article? It is difficult to see why a trader who has used proper materials and done his job efficiently and well should be liable for results so far beyond his control. We physicians have little access to industrial plants, the patient as a witness is none too sound, chemical processes are lost in the patent office or hidden in indecipherable formulae; yet the courts expect guidance, and society prevention, at our hands, and we achieve it largely because, as Professor Rasch[15] of Copenhagen says, we need to become "as penetrating as a Sherlock Holmes."

VALUE OF EARLY NOTIFICATION

Ample details of the treatment of industrial dermatoses will be found in the standard textbooks of dermatology by Sequeira and MacLeod and in the *Index of Treatment* by Robert Hutchison, but the adequate treatment of occupational carcinomata due to light,[16] tar, arsenic, or pitch needs a special note to itself.

The early notification of definite skin lesions is of value—

(*a*) For the information and help of factory managements.

(*b*) For the maintenance of efficient medical supervision of the workers.

(*c*) For the dissemination of knowledge of industrial hazards and social responsibility among the medical profession.

(*d*) It is of dubious value if the subject-matter of notification be in any way questionable on clinical grounds, or if it be likely to give rise to fear, introspection, and contentious litigation.

Under doubtful matter, I include early pigmentary changes, drying and patchy hyperkeratosis of the skin which may be natural in advancing years, or due to sunlight and weather exposure.[17]

A papilloma the size of a pea is a clinical entity not to be mistaken for common infectious warts, and quite unlike a rodent ulcer. This is found as the early lesion of skin cancer in all the carcinogenic industries[18]—that is, pitch, tar, oil, creosote, anthracene,[19] and arsenic. I have described these lesions in a series of papers in the *British Journal of Dermatology* from 1922 to 1928,[20] and the whole is summed up and confirmed by the workers at the International Conference on Cancer, London, 1928. Small and large tumours proved microscopically to be carcinomatous, and papules no larger than a pea proved microscopically to be true carcinomata. The incapacity resulting from these definite early lesions, single or multiple, is *nil* in any site.

In my opinion, owing to the three-monthly medical inspections in factories by skilled practitioners, large dangerous lesions will not in future be overlooked and remain untreated.

RADON IN TREATMENT

The whole field of prognosis in occupational skin cancer has been altered by the introduction of radon into the technique of treatment.[21]

Treatment by radon is most convenient and most effective. Radon gas is obtainable in minute glass seeds which are preferably sheathed in platinum or gold and inserted through a needle-prick under the surface of the cancerous papule. Unfiltered rays obtained by using glass seeds without platinum envelopes always cause painful, tedious ulcers if applied on, or inserted under, the skin.

A radon seed can conveniently contain 1.5 millicuries of radon. Its insertion takes two seconds, and the puncture is sealed with collodion. After five days the seed is expressed. The local skin reaction is slight, not disabling. Patients can continue at work during and after treatment. The result is invariably satisfactory, so that the problem of compensation should not arise.

Workers once affected need not leave the industry, since at least ten years' employment, often much more, is needed before these changes occur. While in the industry they can be supervised and treated efficiently. If they leave, later growths may easily be missed and allowed to develop dangerously. Papules can be dealt with as they arise over long intervals of time. Industry is becoming cleaner, workmen are becoming cleaner, medical skill is more and more accessible, so that the whole position of occupational dermatitis and skin cancer seems to me reasonably under our control, both clinically and administratively.

REFERENCES

1. White, R. Prosser: *The Dermatergoses*, third edition, p. 185.
2. Cd. 4000. H.M. Stationery Office, 1932, p. 12.
3. *Schädigungen der Haut*, Leipzig, 1922.
4. Malis: Erasmus Wilson's *Diseases of Skin*, fifth edition, p. 288.
5. Allbutt and Rolleston's *System of Medicine*, 1911, ix, 81.
6. *Lancet*, 1931, i, 1132.
7. Sybil Overton: Industrial Dermatitis, *Brit. Journ. Dermatol.*, July, 1929, p. 361.
8. Dyson, W.: Ibid., July, 1929, p. 215.
9. *Journ. Indust. Hyg.*, March, 1924, p. 431.
10. *Brit. Journ. Dermatol.*, 1929, xli, 105.
11. *Arch. of Dermatol.*, 1913, 116, 555.
12. *Trans. Coll. Phys.*, Philadelphia, U.S.A., 1916, pp. 38, 151.
13. *Journ. Soc. of Dyers and Colourists*, May, 1932, p. 125.
14. *Lancet*, 1931, ii, 417.
15. *European Clinics*, 1928, p. 218.
16. Unna, P. F.: *Histopathology of Diseases of the Skin*, 1896, p. 718.
17. *Arch. of Derm. and Syph.*, 1929, p. 606.
18. O'Donovan: *Brit. Journ. of Derm. and Syph.*, xxxii, 215.
19. *Journ. of State Med.*, December, 1928, xxxvi, No. 12, 703.
20. *Brit. Journ. Derm. and Syph.*, November, 1924, xxxvi, 477.
21. Brain and O'Donovan: *Proc. Roy. Soc. Med.*, 1931, xxiv, No. 4, 390.

Memoranda

MEDICAL, SURGICAL, OBSTETRICAL

UNUSUAL CAUSE OF "SNAP-FINGER"

The following case, which has several interesting features, seems to me worthy of record.

Fifteen years ago the patient had a radical amputation of the right breast for an early carcinoma. Subsequently a lymphatic obstruction in the right arm developed, producing the usual thick limb, wrist, and hand. These were subjected to various treatments, which possibly reduced the swelling of the extremity, but did not produce a normal limb; functional activity of the limb was never seriously affected. During the last two years there had been a noticeable thickening of the central palmar fascia in the right hand, giving rise to a condition similar to, but not typical of, Dupuytren's contraction, and causing a very slight flexion of the ring and little digits at the metacarpo-phalangeal joints. The patient complained that her grip was weaker, and there was aching in the fingers and palm. In spite of further treatment this condition failed to improve, although it did not get noticeably worse.

About a year ago in the middle finger the patient developed "snap-finger" or "trigger-finger." This differed slightly from the typical condition in that she could easily flex the finger herself into the palm, but on extending it voluntarily

(without aid from the other hand) it opened with a jerking audible snap which caused great pain "from the tip of her second finger to the right shoulder-joint." The hand was x-rayed, and showed, contrary to expectation, no sesamoid interference with the movement of the flexor tendon in the usual position at the base of the proximal phalanx; the sesamoid bones were normal. Apart from some slight evidence of osteoarthritis in various interphalangeal joints, the radiograph did not reveal the cause of the condition.

As the flexor tendon was palpated along its length in both finger and palm, it was difficult to be certain of the maximum point of repercussion or "snap." Under novocain a palmar incision was made, beginning two inches distal to the crease of the wrist in line with the index digit, and passing proximally to a point immediately internal to the termination of the palmaris longus tendon, care being taken not to injure the arteria superficialis volae. The palmar fascia near its apex was exposed, and beneath it a hard fibrous nodule was felt in the length of the tendon of the flexor digitorum sublimis. The central palmar fascia was opened at this point; the tendon nodule felt torpedo-shaped, pointing proximally. A dense adventitious fibrous band radiated externally from the palmar fascia to find attachment to the trapezium. It was evident that the tendon nodule passed easily under the band as the middle finger was flexed, but its distal end, being blunter than its proximal, locked as the tendon returned in its sheath, and required extra voluntary extension effort to overcome the obstruction of the hard band; hence the "snap-finger." Excision of this band cured the condition.

It appears possible that the various palmar thickenings were due to the chronic obstructive lymphangitis resulting from the original radical breast amputation. Possibly the tendon nodule was of this nature; or, alternatively, it may have resulted from irritation of the tendon through constant pressure from the band. The close proximity of the median nerve to the point of obstruction would apparently account for the pain.

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POST-TONSILLECTOMY PAIN

Tonsillectomy may be one of the most painful operations in surgery. In hospital I employ local anaesthesia (percaine 1 in 1,000) preceded by morphine or morphine and scopolamine, and in private practice I use avertin followed by ether. I believe there is less pain after an operation performed under local anaesthesia than after one performed under general anaesthesia.

Formerly, in order to relieve pain, I prescribed aspirin in 10-grain doses, but I found the patients objected to the perspiration that followed. At times I even had to resort to a cocaine spray. I was also forced to employ injections of morphine. Finally I operated on a patient in a convent who had another nun sleeping in the same ward. She found that if she set the alarm clock to go off every two hours and then blew aspirin on to the tonsillar fossa every two hours, day and night, the pain was controlled. Since then I have adopted this procedure. A patient is supplied with two special nurses, one for the day and one for night; the nurse is furnished with an electrically lit tongue depressor and a powder blower and powdered aspirin. It is important that the aspirin should be bought in powder, as powdered tablets contain large particles that produce pain. Every two hours the nurse depresses the tongue and gives one insufflation of aspirin into each fossa.

Although these insufflations keep a patient comfortable, nevertheless there is still the problem of combating the pain on swallowing, and the consequent inability to take food for some days. This has been overcome by the introduction of euphagin by Haslinger of Vienna. These tablets contain amidobenzo-acidethylester, some menthol, and some sodium borate. They are non-toxic. About eight to ten minutes is required to dissolve the tablet in the mouth. The anaesthesia quickly sets in, yet it is not like cocaine, in that it does not interfere with the swallowing reflex. The first patient to whom I gave this had been unable to take food for some days; after sucking one tablet she was able to eat meat sandwiches. I administer these tablets ten minutes before each meal, in addition to the aspirin which is insufflated every two hours. The malodour that occurs after tonsil operations is also controlled by the antiseptic effect of the menthol and sodium borate.

Laszlo, in writing of euphagin, says that he has also used it successfully in painful mouth and throat affections such as carcinoma, pemphigus, stomatitis, and ulcerations of the mouth and throat. So far I have not administered these tablets to children. Though children do not suffer like adults, nevertheless they often refuse their food for some days, and so for children I have adopted aspergum, now sold in England under the name of "feen-a-mint brand aspirin." I gave this first to a child of my own, aged 6, from whom I had dissected the tonsils. He refused to have his breakfast on the third day after the operation, but after sucking a feen-a-mint he was able to take bread-and-butter and egg. These lozenges consist of chewing gum coated with sugar, in which is incorporated 3½ grains of aspirin. They produce a local anaesthesia like the insufflation of aspirin, which few children will tolerate. Furthermore, as they have to be chewed, the jaws are exercised and so convalescence is shortened. Adults also find feen-a-mint brand aspirin, or aspergum, useful, and its administration avoids the constant attendance of a nurse. However, I find the insufflation of aspirin with a powder blower more efficacious in adults.

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A CASE OF PRIAPISM

The following case seems worthy of notice owing to its comparative rarity.

A healthy man, aged 49, by trade a fisherman, happily married for twenty-five years, having four children, was admitted to the Royal Devon and Exeter Hospital with the following history. He cohabited with his wife three days before and woke up next morning with a condition of priapism. He had remained in this state until the third day, when he was sent into hospital.

On admission the penis was in a state of painful priapism; a general examination revealed nothing abnormal. He was admitted to the medical side, where his condition was thoroughly investigated, but nothing was found to elucidate the cause of the priapism. Any venereal infection was denied, and there was no clinical evidence of it. His Wassermann reaction was negative. These findings agree with those of the cases of Riches and of Bayer and Donovan.

The usual local treatment was given without any effect. He was then given a general and a spinal anaesthetic, but with neither of these was any effect on the priapism noticed. He was treated with diathermy, as recommended by Riches, but not till the forty-ninth day from the time of onset did the priapism show any signs of abating. During the following days subsidence was more marked, and on the fifty-third day the penis was pointing downwards.

An interesting feature about the case was that at no time was there any pain or interference with micturition other than a slight difficulty in starting the act during the first two weeks.

Since discharge from hospital the patient has attempted coitus, but has found it to be impossible, owing to non-erection of the organ and what he describes as a "numbness" of the glans. This condition has persisted until the present time, six weeks after the subsidence of the priapism.

Our thanks are due to Dr. Roper, physician in charge of the case, and to Dr. Miller Muir, who carried out the diathermy treatment, for permission to publish this note.

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Reviews

ELECTROTHERAPY

The widening scope for physical measures in the present-day treatment of disease opens up fresh vistas in medicine and surgery, and with the increasing use of such measures it is essential that the scientific basis for their application should be understood. Dr. Kovács's book *Electrotherapy and the Elements of Light Therapy*[1] meets the need of doctors who are genuinely anxious to understand the possibilities of treatment by these methods. In his introduction the author wisely reminds readers that physical therapy is not a separate entity, and should not be practised apart from medicine and surgery. Its employment demands a thorough knowledge of the diagnostic and general aspects of each case ; moreover, any physical measure prescribed has often to be used in conjunction with medical or orthopaedic treatment. While many physical methods call for elaborate apparatus and special experience in their application, others are more simple, and should be in daily use in the practice of every physician. It is all the more important, therefore, that they should be intelligently applied, and that the doctor prescribing them should have sounder reasons for his choice than the extravagant claims set forth in some commercial literature.

All that a general practitioner needs to know, and a great deal that is of more interest to the specialist, can be found in the present volume. There is no attempt to mystify the reader by suggesting that magical effects are obtainable from electric currents therapeutically employed. What is known about the effects of various currents is clearly explained, and where modes of action are obscure this is frankly stated. There are four sections in the book, which deal with the following aspects of the subject: electrophysics, general electrotherapy and electrodiagnosis, elements of light therapy, applied electrotherapy. The chapter on fundamental electrophysics is concise and well illustrated, while that on measurement and regulation of electromotive force should dispel the confusion existing in many minds about these more technical matters.

Before passing to a description of actual treatment the author explains the production and physical effects of therapeutic currents, again with an illuminating clarity. Later the physiological effects of individual currents are described in detail. Especially interesting is Dr. Kovác's account of the theory and technique of electro-diagnosis. Hitherto, testing for R.D. has been a bogy in the minds of medical students, who learned the polar formula without understanding its meaning or application. They will hear with relief that this formula is disregarded in present-day electro-diagnosis. The technique of the more accurate condenser method of testing is described, with its later development of testing for the chronaxie. An account of the physics of high-frequency currents precedes the consideration of their physical and physiological effects. Medical diathermy, electro-desiccation, and coagulation are described in some detail, and in a helpful practical manner. A chapter on electrical accidents in homes and in industry is welcome at this point. Perhaps the most interesting part of the section on the elements of light therapy is the description of the physics of radiant energy. The action of ultra-violet rays and their clinical application is very briefly, though competently, summarized.

Good printing and well-chosen diagrams and tables add to the value of a book which is pleasantly free from the pseudo-scientific slang which mars most other American books on electrotherapy. As an unprejudiced summary of the present state of knowledge of electrotherapy it should be read by every progressive physician.

[1] *Electrotherapy and the Elements of Light Therapy.* By Richard Kovács, M.D. London: H. Kimpton. 1932. (Pp. xvi + 528 ; 211 figures. 30s. net.)

MOVEMENTS OF THE VERTEBRAE

From the time of E. H. Weber (1827) various physiologists and anatomists have investigated the movements of the vertebrae with more or less success, and with differing conclusions. These observers have followed generally one of two methods: (1) measurement on the dead body either of the spine *in situ* or after removal of ribs, muscles, ligaments, etc. ; (2) measurement in the living individual of shadows cast on a screen—a very imperfect proceeding. In his radiological observations on the movements of the vertebrae,[2] Dr. SIGVALD N. BAKKE of the State "Haukeland" Hospital in Bergen, Norway, discusses these methods and points out their defects. It is obvious that the exact positions and movements of the bones in life or death must be masked by the dense soft parts, while if these latter are removed by dissection the conditions are altered, and movements may be freer than normal. It is also true, as Dr. Bakke alleges, that in the dead body the absence of muscular tone and control must make a considerable difference in the mobility of the parts. He has therefore used radiological means, by which alone the soft parts can be eliminated without impairment of their functions as limiting mechanisms. He examined by means of *x* rays thirty-one persons, aged from 3 to 79 years. He gives a full account of his method, and of the precautions which he took against error.

The results arrived at by Dr. Bakke are, as he says, widely different from those of other writers. For instance, E. H. Weber asserted that there were alternate regions of mobility and rigidity in the spine. Bakke, on the contrary, finds that there are nowhere any inflexible parts interposed between the flexible, but that every vertebral joint takes its part, however small, in movements of the spine as a whole. His investigations have yielded the following results. As regards dorsal and ventral flexion, the greatest range of motion is found in the cervical spine, the total being 80 degrees (R. Fick gave it as 180 degrees, and E. H. Weber as 152.75 degrees). In the thoracic spine the total range is only 67.9 degrees (R. Fick gives 135 degrees). The total flexibility of the lumbar spine is 70.6 degrees (R. Fick gives 113 degrees, and E. H. Weber 84 degrees). The total flexibility of the entire column amounts to 219 degrees (the corresponding figure of R. Fick is 428 degrees, and that of E. H. Weber 334 degrees). It appears that Professor Fr. Müller of Tübingen has lately been studying the lateral flexibility of the normal spine, and has found that "the spine appears in a form which has hitherto not been known"—namely, a row of vertebral bodies in a straight line, running from the sixth to the tenth thoracic vertebra. Bakke says that he has made the subjects of his experiments perform a maximum of side-bending (without associating rotation with it), and in none of them has he been able to find Müller's "schnurgerade verlaufende Reihe." The total lateral bending of the cervical spine he found to be about 23 degrees, of the thoracic 30 degrees, and of the lumbar 24 degrees. The total lateral flexion of the entire spinal column may vary between 75 and 80 degrees. Fr. Müller has found 86 degrees, in spite of the fact that he has observed no lateral flexion from the sixth to the tenth thoracic vertebra ; he also found the total lateral flexion to be 165 degrees in a spinal column without any ribs attached to it. These data refer to the twenty-four

[2] *Röntgenologische Beobachtungen über die Bewegungen der Wirbelsäule.* Von Dr. med. Sigvald N. Bakke. *Acta Radiologica*, Supplementum xiii. Stockholm: P. A. Norstedt und Söner. 1931. (Pp. 75 ; illustrated. Swedish crowns 10 net.)

vertebrae of the cervical, dorsal, and lumbar regions. They do not include the movements (of extensive range) between the skull and the cervical spine, and the fifth lumbar vertebra and the sacrum.

We think that perhaps Dr. Bakke has adhered too closely to the regional distinctions of classical anatomists instead of attaching the first two thoracic vertebrae to the cervical, and the last two or three to the lumbar region. So arranged, the statements of range of movement would convey a better general idea of the actual state of things. But that may be hypercriticism. This is a very accurate and valuable monograph to anyone who has to study the exact anatomy and functions of the human spinal column. It is well illustrated with twenty-four reproductions of photographs and radiograms and a number of tables.

PRACTICAL PAEDIATRICS

Dr. R. C. JEWESBURY has now prepared in *Mothercraft, Antenatal and Postnatal*[3] a valuable manual for students and practitioners which sets out the excellent teaching of Truby King for the first time for a medical audience, as distinct from the various books now available for mothers and nurses. To make the volume complete with antenatal and post-natal advice he has enlisted the aid of Dr. J. S. Fairbairn, who contributes an excellent chapter on the relation of mothercraft to other aspects of maternity work, while Professor J. Mellanby writes on the physiology of lactation. Dr. Jewesbury is responsible for the bulk of the book, and his exposition of the fundamental Truby King principles is excellent. Naturally breast-feeding receives first consideration, and nowhere is the teaching of the Mothercraft Training Society better set forth than in this section. A particularly good chapter on the difficulties sometimes met with in breast-feeding and their management will be most helpful to the practitioner. On artificial feeding the book is less good, largely because modern paediatric teaching is all against the extreme dilutions of milk advised. For example, a baby of 8 to 9 months is put on a milk mixture containing one pint of milk and one pint of water, two ounces of which is lime-water. By this age most babies are on to full undiluted milk, according to standard authorities; and the case for diluting milk to such a degree as set out on page 73 is not convincing. Various common ailments in the baby are dealt with in concluding chapters, and an appendix contains useful tables. Whether Dr. Jewesbury is right or wrong in his support of the Truby King methods for artificial feeding he is to be congratulated on the courage of his convictions, and the book can be thoroughly recommended as being an excellent manual on the whole subject of mothercraft from the pen of one who has had ample opportunity of putting his beliefs into everyday practice.

A volume on common children's diseases[4] (the French title being quite untranslatable) consists of lectures delivered by thirteen workers at the Grancher Annexe of the St. Louis Hospital, published under the editorship of Dr. L. BABONNEIX. Fifteen clinical lectures in the best French style are presented in the volume, which includes a good account of lipoid nephrosis by Dr. J. Sigwald and a lecture on anorexia by Dr. J. Hutinel. An account of anaemia in the infant is without any mention of the modern use of copper in addition to iron, but the date of delivery of the lecture indicates that this new treatment could hardly have been included.

In a Précis of Children's Therapeutics[5] the same author, Dr. L. BABONNEIX, has produced a very full record of drugs and procedures useful in the diseases of childhood. Drugs and physical measures are described first, followed by an excellent summary of the treatment to be adopted in the different diseases, arranged in alphabetical order under the various systems. Diets for different disorders are included. Three indexes, of a very high order of merit, make the book a noteworthy production, and the binding is also distinctly solid for a French book.

"NOSOKOMEION"

We have received Nos. 1, 3, and 4 for 1931 of *Nosokomeion*, or Quarterly Hospital Review. No. 2 was noticed in our issue of June 27th, 1931, and a special number, containing the transactions of the International Hospital Congress, on October 31st, 1931. The international nature of the contents of this periodical should interest all who have any connexion with hospitals. The articles are printed in English, French, or German, and are individually summarized in each of these languages. No. 1 contains twelve articles, of which the following deserve special mention: K. Sudhoff, "Die geschichtliche Entwicklung der Beziehungen zwischen ärztlichen Beruf und dem Krankenhause"; E. H. L. Corwin, "The relation of the medical profession to the hospitals in North America"; K. Saigo, "The development and present situation of hospitals in Japan"; and R. C. Cabot, "Medical ethics in the hospital."

No. 3 contains twenty-two articles on administration and management, contributed by specialists from thirteen nations, and covers all administrative and economic problems connected with hospitals. The following are of special interest: G. H. Agnew, "Problems of administration and management in hospitals"; L. Urwick, "Rationalization and hospital administration"; S. L. Butler, "The technical organization of the administration and management in hospitals"; A. Merckx, "Quelques aspects de l'économie générale et spéciale des hôpitaux"; J. L. van Lier, "The accessory services of institutions for the sick, their advantages and uses in connexion with occupational therapy"; E. C. Hayhow, "Office management technique in the hospital"; B. W. Caldwell, "Present state of administration and management in hospitals in the United States"; and C. E. A. Bedwell, "Hospital administration in England."

No. 4, which contains numerous illustrations, is devoted to hospital construction and equipment, and gives an international survey of the subject in twenty-two articles. The article by C. E. Elcock, "The present position of hospital planning and construction in Great Britain and Ireland," is of special interest in this country. Amongst others worthy of particular mention are: R. Dujarric de la Rivière, "Evolution des idées pour la construction des hôpitaux en France"; E. F. Stevens, "Hospital construction in the United States at the present time"; G. B. Roatta, "Lo sato presente delle costruzioni ospedaliere in Italia"; A. Lommel, "Die letzte Entwicklung und der heutige Stand des Krankenhausbaues in Deutschland und Österreich"; A. Rollier, "La clinique manufacture internationale centre d'heliothérapie et d'aptation au travail pour les tuberculeux chirurgicaux"; and J. S. Hirsch, "The hospital and the department of radiology."

Extensive bibliographies are contained in Nos. 1 and 3, which should prove of great value to all interested in hospitals.

[3] *Mothercraft, Antenatal and Postnatal.* By Reginald C. Jewesbury, M.A., D.M.Oxon., F.R.C.P.Lond. London: J. and A. Churchill. 1932. (Pp. ix + 178; 21 figures, 13 in colour. 10s. 6d.)

[4] *Actualités Infantiles.* Leçons faités à l'Hôpital Saint Louis, Annexe Grancher, sous la direction du Dr. L. Babonneix. Paris: Masson et Cie. 1932. (Pp. 287; 53 figures. 35 fr.)

[5] *Thérapeutique Infantile. Collection de Précis Médicaux.* By L. Babonneix. Paris: Masson et Cie. 1932. (Pp. 508; 56 figures. 45 fr.; broché, 55 fr.)

TUBERCULOSIS

The fourth volume[6] of "Results of General Tuberculosis Research" has now been issued, previous volumes having been noticed in these columns, on October 11th, 1930 (p. 103), May 16th, 1931 (p. 850), and January 9th, 1932 (p. 64). Several important aspects of the subject are dealt with in the eight monographs included in the present volume. Two of these discuss the problems of tuberculosis in elderly subjects: Dr. H. H. Kalbfleisch dealing with the pathological anatomy, and Dr. J. E. Kayser-Petersen with the clinical standpoint. Treatment is represented in three important papers. Dr. W. Kremer discusses oleothorax, Dr. W. Luedke gives his experiences with the division of adhesions in pneumothorax work and an excellent account of the methods available along with a good discussion of the pathology of adhesions, while Dr. Georg Schröder contributes an account of the basis of treating tuberculosis by tuberculin in all its variations, by vaccines, by serum, by non-specific biological preparations; and also includes an up-to-date summary of chemotherapy and general pharmacology in relation to tuberculosis. This last is perhaps the most masterly exposition of the subject yet written, and a bibliography of nearly ten pages makes it very valuable for future students of the subject. Dr. K. Nüssel writes a beautifully illustrated account of the healing processes in the tuberculosis of childhood as traced in *x*-ray photographs. The remaining articles deal with tuberculosis in a sparsely populated area, by Dr. M. Arborelius, and with the topography and morphology of calcification in thoracic tuberculosis, pulmonary and glandular. It is impossible in the space of a brief review to do more than indicate the scope of this volume. Each monograph appears to contain enough material to stimulate fruitful discussion, and students of the various tuberculosis problems will find great help in this further important contribution to the subject.

NOTES ON BOOKS

A new and revised edition has now been published of *Recent Advances in Obstetrics and Gynaecology*,[7] by Mr. ALECK W. BOURNE in association with Dr. LESLIE H. WILLIAMS, whose name appears on the title-page for the first time. This popular textbook has certainly gained in value by the care that has been taken to bring it up to date, and it can be as confidently commended as were its two predecessors.

The ninth series of Professor P. NOBÉCOURT's Clinical Lectures on Children's Diseases,[8] which have been reprinted from various journals of the last ten years, are devoted to certain acute infections. Eight of these lectures deal with acute rheumatic fever, or, as he prefers to call it, Bouillaud's disease, nine with typhoid and paratyphoid fevers, and three with scarlet fever. The aspects of rheumatic fever which he discusses are the cervical and cervico-sciatic localizations of the disease, acute endocarditis, pericarditis, pancarditis, and aortitis of rheumatic origin, syndromes of pulmonary and pleuro-pulmonary congestion, and abdominal syndromes. The lectures on enteric fever are devoted to the peculiar course of the disease in childhood, especially its sudden onset at that age, the cardiac complications, the initial meningeal syndrome, and the abdominal syndromes which may be due to intestinal perforation or other causes. The concluding chapters deal with the coexistence of scarlet fever and enteric, and scarlatinal adenitis and arthritis.

The life of a sister in a general hospital should prove an interesting theme for a novel. In *Hospital*,[9] NORAH C. JAMES surprises the medical reader by her intimate knowledge of life in such an institution, a knowledge that surely must be the result of personal experience. The busy atmosphere of a surgical ward and the operating theatre is conveyed with remarkable conviction. Those who have never penetrated to the mysteries of the sisters' quarters can only guess that what they are told here may be true. The character of Sister Adrianne, the central figure in the book, is drawn with sympathy but not sentimentality. Miss James does not make her characters shrink from contact with reality, and when this contact is unavoidably unpleasant she does not burke the issue.

The recently published special number of *Nosokomeion*,[10] or Quarterly Hospital Review, contains the proceedings of the Second International Hospital Congress, which was held in Vienna from June 8th to 14th, 1931. The subjects discussed were diets in large general hospitals, introduced by Dr. Carl von Noorden of Vienna; the influence of health insurance upon hospital practice, by Mr. T. B. Layton of London; the costs of hospital construction, introduced by H. Distel of Hamburg; the ratio of nurses to patients, introduced by Miss Christiane Reimann of Geneva; the position of psychiatry and neurology in general hospitals, introduced by Wilhelm Alter of Düsseldorf; the cost of maintenance of patients, introduced by André Gouachon of Lyons; the question of dispensaries and out-patient departments, introduced by E. H. L. Corwin of New York; hospital terminology and definitions, introduced by J. Wirk of Frankfort; and hospital legislation, introduced by W. H. Harper, secretary of the Royal Wolverhampton Hospital. A list of the delegates and members of the congress is prefixed to the work, and a bibliography of hospital service is appended.

The publisher of Mr. W. B. SEABROOK's *Jungle Ways*[11] suggests that his "extraordinary adventures" will be of interest to medical readers. They might be, if there were a jot of evidence to support them. Mr. Seabrook may be an excellent journalist, but his scientific attainments do not command our respect. With little knowledge of any of the languages, he claims to have discovered in a remarkably short time more about the Yafouba, the Gwere, the Mossi, and the Habbe than anyone has yet done. He essays to describe not only the things he has seen, but also the esoteric meaning of institutions and beliefs, an understanding of which would involve a complete familiarity with the language. Among other experiences, he seems to have visited a female circumcision camp, from which normally all men are excluded on pain of death. He describes the nature of the operation, which he fallaciously attributes to hygienic motives, and then goes on to pour scorn on the ethnologists who assert that "in the operation among the West Coast people the clitoris is excised." Unfortunately for the omniscient Mr. Seabrook clitoridectomy *is* practised on the West Coast, even if it does not occur among his Yafouba. His concluding chapter on the Habbe phallic worshippers is a masterpiece of misapplied mysticism; but he goes too far in attributing his own obsessions to Africans. He is immensely proud of having eaten human flesh with a cannibal tribe, but is it a matter of such moment? It is rather pathetic in face of all his bombast on this and other subjects to read: "I know that all I have seen is nothing, for that which is hidden is hidden, and will never be revealed."

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[6] *Ergebnisse der Gesamten Tuberkuloseforschung*. Herausgegeben von H. Assmann, H. Beitzke, H. Braeuning, St. Engel. Band iv. Leipzig: G. Thieme. 1932. (Pp. 494; 197 figures. M.47; Geb. M.49.)

[7] *Recent Advances in Obstetrics and Gynaecology*. By Aleck W. Bourne, M.B., B.Ch., F.R.C.S., F.C.O.G., and Leslie H. Williams, M.D., M.S., F.R.C.S., M.C.O.G. Third edition. London: J. and A. Churchill. 1932. (Pp. x + 418; 87 figures. 12s. 6d.)

[8] *Clinique Médicale des Enfants*. Maladies infectieuses, rhumatisme articulaire aigu, fièvre typhoïde, scarlatine. By P. Nobécourt. Paris: Masson et Cie. 1932. (Pp. xv + 420; 151 figures. 55 fr.)

[9] *Hospital: A Novel*. By Norah C. James. London: G. Duckworth and Co., Ltd. 1932. (Pp. 312. 7s. 6d. net.)

[10] *Nosokomeion*. 2 Supplementary Number. Stuttgart: W. Kohlhammer. 1932. (Pp. 313. M.11.25; subscribers and members of Congress, M.7.50, plus postage.)

[11] *Jungle Ways*. By William B. Seabrook. London: G. Harrap and Co., Ltd. 1931. (Pp. 280; 33 plates. 10s. 6d. net.)

British Medical Journal

SATURDAY, AUGUST 13th, 1932

BIOLOGICAL STANDARDIZATION

Modern methods of investigation by exploration of the functional capacity of the different organs of the body by radiology and biochemistry have so increased the accuracy of diagnosis that a corresponding assurance of the efficacy of the remedies available is to be desired. Tests of the chemical purity of drugs are only a small part of present-day requirements. Biological standardization should be demanded where it is possible to carry this out. We drew attention to the important work in this connexion which is being carried out by the Permanent Standards Commission of the Health Organization of the League of Nations in a leading article in the *Journal* of October 31st, 1931. The difficulty in many instances has been to find a suitable reagent, and experimental pathology has often of late advanced or remained stationary according to our knowledge or ignorance of an appropriate method of approach. Sometimes it has been possible to carry out titrations with the accuracy of ordinary chemical tests, as in the estimation of the antitoxic values of serums, by using, for example, guinea-pigs in the case of diphtheria and white mice in the case of the pneumococcus. The hypoglycaemia produced in rabbits has made possible a world-wide uniform standard in the manufacture of insulin. In other instances the biological experiments required entail a prolonged observation of small laboratory animals. The knowledge of vitamins and the vitamin content of various foods was elaborated during and since the war by a band of workers whose patience triumphed over the monotony of tedious routine.

The value of liver treatment in pernicious anaemia is now well established. It is unfortunate, therefore, that so far no standard reagent has been discovered to test the efficacy of liver extracts except the pernicious anaemia patient himself. It is recognized that liver extracts prepared according to an accepted method may be impotent, and it would be most desirable to have an assurance that extracts placed on the market are active. At present the only way is to have observations made on patients with pernicious anaemia in hospital, where, if the response is absent, other measures can be adopted without delay. In a disease which requires rapid and careful handling it is not too much to demand that therapeutic substances should be potent, though this may be a difficult matter at present. That in the case of hog's stomach extract the potency is related to the pepsin content is indicated in a paper published early this year in our columns.[1] The pepsin is not the active principle, but appears to serve as a rough laboratory guide to the possible presence or absence of the, as yet, unidentified active substance. In the case of liver extract the reticulocyte response of a patient with pernicious anaemia appears to be the only criterion of potency.

Biological methods have thrown new light on the stimulus to haemoglobin formation in the case of secondary anaemia. A severe secondary anaemia can be produced in animals by a milk diet, and animals or babies with this nutritional anaemia may be used for observations on the relative value of iron and other metals. In this way a revision of the results of the older workers has been made. In a paper on the relative value of inorganic and organic iron in haemoglobin formation, Elvehjem[2] points out that Bunge's theory that only iron which occurs in food as organic compounds is absorbed and assimilated as such, and built directly into haemoglobin, is not strictly true. In a series of experiments with white rats made anaemic by a milk diet, Elvehjem found that, in the absence of copper, organic iron (haematin) was as ineffective as inorganic iron (ferric chloride) for the cure of the anaemia. Further, inorganic iron can be built up into haemoglobin, for while in the presence of copper organic iron promotes a partial cure of the anaemia, the regeneration is neither so rapid nor so complete as the recovery obtained when ferric chloride is used. There seems to be little doubt, therefore, that haemoglobin is formed during normal metabolism in mammals from the iron present in the food, and that copper, which is also supplied through the food, is necessary for this synthetic process. When the amount of iron or copper in the food becomes insufficient to supply the need—either because of a decreased supply of these elements in the food, or because of a greater demand for haemoglobin formation—anaemia ensues. This insufficiency can be corrected by the addition of inorganic iron and copper. Thus biological methods have led to much clearer views on the treatment of anaemia than were obtained by chemical analysis alone.

Another paper may be mentioned in this connexion as throwing further light on the treatment of nutritional anaemia. Anaemia in infants is produced by an exclusive milk diet, and such infants can be used for testing the value of the various methods of treatment. In a series of infants with nutritional anaemia (" milk anaemia ") observed in an institution, Maurer, Greengard, and Kluver[3] found it possible to control the anaemia by administration of liver extract and iron containing traces of copper. But the administration of iron with traces of copper failed to bring about an improvement in the blood in about 50 per cent. of cases, and liver alone failed in 37 per cent. Infants in the latter group, however, showed significant improvement in the blood after iron was added. Also, of those infants of the iron series who had failed to show improvement in the blood on the iron and copper

[1] Wilkinson, J. F.: *British Medical Journal*, February 20th, 1932, p. 325.

[2] Elvehjem, C. A.: *Journ. Amer. Med. Assoc.*, March 26th, 1932, p. 1047.

[3] Maurer, S., Greengard, J., and Kluver, C.: Ibid., p. 1069.

mixture, those who received liver extract in addition made good progress. What part the individual substances play is still doubtful, and there are many types of secondary anaemia ; but the observations cited lead us to expect useful results from research along similar lines.

TRAFFIC IN DANGEROUS DRUGS

The report of the British Government to the League of Nations on the traffic in opium and other dangerous drugs for the year 1931 affords cogent evidence as to the efficacy of the legislation and administration which sought to carry out the obligations entered into by the Hague and the Geneva Conventions so far as this country is concerned. Drug addiction, it avers, is not prevalent in Great Britain, and such illicit traffic as has been discovered within its shores has been inconsiderable, while the seizures of contraband have been insignificant in amount. Sixty-nine prosecutions were instituted in the year 1931 under the Dangerous Drugs Acts, 1920 to 1925. In fifty-one cases fines were imposed, in only two cases amounting to £100 or more ; while in eight cases imprisonment ranging from one to twelve months was inflicted. In three cases deportation was recommended. The report is a stencilled document of some thirty-six foolscap pages, issued by the Home Office. It appears within a fortnight of the report on the work of the fifteenth session of the League's Advisory Committee on Traffic in Opium and Other Dangerous Drugs.[1]

Seven British firms are licensed to manufacture medicinal opium—four in London, two in Liverpool, one in Edinburgh—and 4,277 lb. of that drug were manufactured. Two firms are licensed to manufacture morphine and heroin, both in Edinburgh, and between them they manufactured last year 31,119 oz. of morphine salts and 1,466 oz. of morphine alkaloid. To these amounts should be added 1,777 oz. of morphine and 1,087 oz. of morphine salts used in the manufacture of heroin, 5,011 oz. of morphine used to produce codeine, and 1,699 oz. of the same alkaloid employed in making ethyl-morphine (dionin). Of heroin salts 3,203 oz. were manufactured, besides 123 oz. of heroin itself. One firm, located in Battersea, is licensed to manufacture cocaine, of which 429 oz. were produced, together with 14,474 oz. of its salts. Unlike the experience of recent years the great bulk of the raw opium imported came from Turkey, very little having been received from India, and none from Persia. There was a considerable increase of exports of raw opium in 1931 compared with the previous year, the bulk of which was consigned to Holland. The total exports of morphine and its salts were considerably less than in the previous year, and amounted to 16,284 oz., though the amount sent to China—more than 2,000 oz.—was nearly double the amount supplied to that country in 1930. The exports of British-made heroin also show a reduction, and amounted to 2,152 oz.

[1] Allen and Unwin: League of Nations Publications Department, 40, Museum Street, W.C. 1932.

Brief mention is made of the co-operation of the British Government with those of Holland, the United States, Germany, and Egypt in efforts to reduce the very extensive illicit traffic which still obtains. In the *Journal* of April 30th we referred to the vigilant labours of T. W. Russell Pasha in connexion with smuggling operations in the Levant, which have quite recently led to the exposure of one of the most nefarious gangs of illicit traffickers, and their conviction and sentence to fine and imprisonment. If all nations party to the Hague and Geneva Conventions administered with energy legislation such as that contained in our Dangerous Drugs Acts, and if the vigilance of Russell Pasha were emulated in countries where illicit traffic is still notorious, the restriction of narcotics to medical and scientific purposes only would be much nearer achievement.

ALCOHOL AND INHERITANCE[1]

Under the above title Miss Durham and Miss Woods record the results of a number of years' work on a problem of great scientific interest and of equally great practical importance. Alcohol is frequently referred to as a " germ poison " or " racial poison," as it is asserted that in addition to its effects on the individual alcohol may injure the germ cells as well as the developing embryo. It has also been stated that injury is caused to the germ plasm itself, and that such injury is then transmitted to future generations. It is well to distinguish clearly between the three types of injury. The first is a direct effect of the drug on the developing embryo ; the second is an effect on the male and female germ cells leading to damage to the offspring of a non-transmissible nature ; the third is the induction of actual mutations. The first two types can be demonstrated under experimental conditions, though it may be doubted whether the second has ever been clearly proved in the case of alcohol. An effect on the germ cells has, however, been produced with chloral hydrate. Hertwig immersed frog sperm in a 0.3 per cent. solution, and afterwards allowed the sperm to fertilize normal eggs: only deformed young resulted. With regard to the third type of injury, it has not yet been conclusively shown that any agent other than *x* rays or radium can induce mutation. The practical question, however, is not so much whether these effects can be demonstrated *in vitro*, but whether the administration of drugs such as alcohol to mammalian parents does in fact damage the offspring. The results of most workers have been negative or inconclusive, but Stockard, conducting a series of controlled experiments with large numbers, claimed that the various injuries had in fact been sustained. He gave alcohol to guinea-pigs by daily inhalation for two to three hours, and stated that, even when only the male was treated, profound effects were produced on the offspring: these were transmitted to subsequent generations, although there was no further alcoholization. Stockard's results have been widely quoted, and it is highly satisfactory that Miss Durham and Miss Woods, under the auspices

[1] Medical Research Council. Special Report Series, No. 168. *Alcohol and Inheritance: An Experimental Study.* By F. M. Durham and H. M. Woods. London: H.M. Stationery Office. 1932. (1s. 3d. net.)

of the Medical Research Council, should have repeated the experiments in such a thorough manner. The repetition followed Stockard's plan closely, the only important differences being that the offspring of alcoholized animals were inter-bred instead of being mated to controls, and that the guinea-pigs received green food every day. These alterations in technique would only bring out the effect of the alcohol more clearly if it were present. Briefly, in no particular is Stockard's work confirmed. According to him monstrosities were produced. Miss Durham and Miss Woods found one in 674 offspring of controls, and ten in 6,309 offspring of treated animals. Owing to their improved genetic technique they were able to show that the occurrence of monsters was in all probability due to hereditary factors in the original stock. Fertility and mortality (stillbirths and deaths up to thirty days) were not changed, with the exception of the result discussed below. Birth weights and growth rates were also uninfluenced, as even the first generation was not affected, and it is not surprising to find that neither were subsequent generations. Contrary to the findings of Dr. Agnes Bluhm, the sex ratio was not altered. Owing to age differences between control and treated animals, and owing to progressive inbreeding, complications are introduced into the mathematical treatment of the results; this is admirably carried out. The tables presented form a most complete and detailed record, from which, incidentally, much valuable information on the effects of age, litter size, etc., may be gleaned. The authors are to be congratulated on an excellent piece of work. It is perhaps inevitable that, when previous investigations are repeated with negative results, the reader should be intrigued by side-issues which cannot be fully explored without enlarging the scope of the experiment. In Miss Durham and Miss Woods's paper there is one important positive result, and in our opinion the authors do not give it sufficient emphasis, nor are the data presented so as to bring it out most clearly. The figures are analysed to test the effect of the duration of alcoholization. In alcoholized males there was no effect at all, even when the time on alcohol exceeded two years. Females were unaffected when the duration was less than one year; when it was one to two years, however, the mortality of offspring rose appreciably, and still more sharply for periods exceeding two years. Litter size, however, was unaltered. As no change is brought about by alcoholizing males, it is justifiable to add the figures for treated females mated to treated males to those for treated females mated to control males. The figures must be considered in relation to the age of the female, as it is known that the mortality rate rises with increasing age, and the animals that were alcoholized for long periods were, on the average, much older than those alcoholized for a short period. Again, it is permissible to add the figures for control females mated to control males and control females mated to treated males.

Untreated Females			Treated Females		
Age of Mother	No. of Offspring	Mortality	Duration on Alcohol	No. of Offspring	Mortality
Months		Per cent.	Months		Per cent.
0-12	394	14.5	0-12	298	13.1
12-24	272	18.8	12-24	197	25.4
24-36	120	15.8	24+	72	38.9
36+	90	23.3	—	—	—

It is clear that the increase in stillbirths and deaths up to thirty days cannot be attributed to the direct influence of alcohol in the maternal blood stream on the developing foetus, for, if this were the case, the effect should be produced in any animal treated during pregnancy irrespective of the total duration of alcoholization. Further, it is remarkable that the number of young born was not reduced also. Previous workers have found increased mortality with maintained, or even increased, fertility when females are alcoholized, but we are not aware that any author has demonstrated the relation of this effect to the duration of the alcoholization. This question is undoubtedly worthy of much further investigation.

TREATMENT OF INFANTILE DIARRHOEA

Feeling that their previous efforts at therapy had at the best been haphazard and probably at times misdirected, Drs. M. W. Poole and T. B. Cooley of Detroit made a careful study of the cases of infantile diarrhoea coming under their care in the summer of 1930, in order to ascertain the best form of treatment. The results of this work have recently been published,[1] and many points of considerable interest are brought out. The blood was examined on admission (whenever possible before any treatment had been instituted), and at repeated intervals during the child's stay in hospital. The following estimations were made: haemoglobin percentage, red cell count, white cell count, plasma cell ratio, specific gravity of the blood serum, and total chlorides. These determinations gave a very good idea of the degree of dehydration of the blood, and served as an indication for treatment. A group of children suffering from conditions other than diarrhoea were first investigated to obtain satisfactory normal figures for the plasma cell ratio and for the specific gravity of the blood. In babies who were admitted with mild or moderately severe diarrhoea, with or without vomiting, the specific gravity of the serum was for the most part within normal limits. Three in this group gave a reading of over 1029, and had symptoms severe enough to demand active and energetic treatment—namely, intravenous transfusion of dextrose or saline, and subcutaneous injection of fluids. Another group of infants with advanced toxaemia, severe vomiting, diarrhoea, dehydration, and high fever showed, with one exception, a specific gravity of the serum of between 1031 and 1040, while the percentage of cells varied from 27 to 41.6, the normal figures being between 22 to 30.7. In this group the majority had haemoglobin levels and red cell counts well above the average, offering confirmatory evidence of blood concentration. It became evident that any routine system of treating infantile diarrhoea was bound to fail, and these laboratory findings had to be taken into consideration in deciding on the line of treatment for every case. Obviously, in the group of severely ill patients mentioned above the chief requirement is water, and a practice of routine blood transfusion, for example, can only lead to an overloading of cells in the child's circulation. What is needed is dilution of the existing plasma. A striking

[1] *Amer. Journ. Dis Child.*, 1932, xliii, Part I, 1101.

example of this is included in the present report, and here repeated observations on the blood before and after various lines of treatment show very exactly the benefits obtained and the harm done. Various other points are also emphasized in this study. For example, the authors are quite unable to offer support to those views which blame infections of the ear and mastoid or nasal sinuses as the primary factor in many cases of infantile diarrhoea. When otitis media developed in their patients it occurred during the stay in hospital, and it is their opinion that such infections can be prevented if only a brief period in hospital is aimed at as an ideal in treatment. Very few cases of diarrhoea, in their opinion, are initiated by infections of the ear. The diet in these cases, once the dehydration has been dealt with, is extremely simple. Unsweetened evaporated milk, diluted to one-half or two-thirds strength, was used almost exclusively, with addition of protein or carbohydrate, and with slight modification in certain cases in which there was evidence of a low hydrogen-ion concentration of the gastric juice. Once the dehydration was cured, vomiting usually ceased in a dramatic manner. Therefore, as soon as feeding could be begun the question of vomiting was no longer present, and almost any formula on the lines mentioned proved satisfactory, provided it was begun cautiously and increased carefully.

ADVANCES IN RADIOLOGICAL TECHNIQUE

Distension with gas produced by effervescence of soda and tartaric acid is an old method of determining the size and situation of the stomach which has rather lapsed since radiology has devised much surer ways. The inquiring mind demands more information from *x*-ray pictures, however, than is given by merely filling the stomach with opaque material and demonstrating its outline. The recent advances in *x*-ray technique enable a picture to be obtained of the lining of the stomach when a small opaque meal is allowed to spread over the wall of a previously empty stomach, or when pictures are taken at the emptying stage of an ordinary barium meal. In these ways the striae formed by folds of mucous membrane are shown to be normal in direction and thickness, or disorganized as the result of gastric lesions. Duval and Béclère (*La Presse Médicale*, June 22nd) point out that even striae pictures of the stomach are not clearly suitable for interpretation of endogastric pathological conditions. They claim that insufflation of air into the stomach gives the most complete results in their demonstration. The method is particularly adapted for showing thickening of the stomach wall caused by cancer and polypoid growths. The technique the authors adopt is to pass an Einhorn tube and slowly distend the stomach with air. The process thus enlarges the customary gas bubble until the whole stomach is ballooned. Very clear pictures are thus obtained when cancerous growths project into the stomach lumen, and in some instances a mobile polyp with fixed pedicle can be shown. Not so much information is obtained in cases of ulcer as by the opaque-meal method. Indeed, in the presence of an active ulcer, distension may be a danger in producing rupture or starting haemorrhage. Nevertheless, useful results may often be obtained where there is thickening of the gastric wall as the result of tumour. In the same journal Kadrnka and Sarasin describe a combined method of distending the colon with air inflation after the partial evacuation of an opaque enema, and show how efficacious this may be in rapidly demonstrating the appendix. Although the lumen of the appendix is directly in communication with the caecum, it is filled only in a small proportion of cases when the colon is injected with an opaque enema. After partial evacuation of the enema it is often found that the appendix had been filled but had been hidden by the loaded caecum. The authors show that if air is now pumped into the colon the consequent distension still further clarifies the abdominal picture, and enables the appendix to be easily found. In cases, therefore, where a rapid report on the condition of the appendix is required the authors do not give an ordinary opaque meal, for they find that even after observing for eight to twelve hours only 35 per cent. of appendices can be shown to be filled by this method. They give a barium enema, screen and take pictures, allow the patient to evacuate the bowel, screen again, and, if necessary, inflate the bowel by rectal injection of air. In this way they have demonstrated filling of the appendix in sixty-six of their last ninety cases. Of the twenty-four cases not filled, sixteen were found at subsequent operation to be pathological and eight were not operated upon. It would seem, therefore, that the authors have brought forward not only a rapid but an exceedingly accurate method of determining whether there is a lesion of the appendix vermiformis.

GOLD IN THERAPEUTICS

During recent years gold has come into prominence in therapeutics, and a number of pathological conditions have been treated with varying success by different compounds of the precious metal. A little work on salts of gold in dermatology and syphilology,[1] by MM. Lebeuf and Mollard, forms a useful compendium of the various methods of employing gold and the results obtained in the diseases in which it has been most extensively exploited, nor have the authors forgotten to give an account of the accidents and toxic effects which occasionally follow its administration. It is well known that gold is a metal very powerful both for good and for evil, this being true in therapeutics as well as in the other activities of life in which it plays a part. The most widely used auriferous compound in medicine is sanocrysin, which is, chemically speaking, a double thiosulphate of gold and soda. It is a compound on the same plan as the "hypo" well known to photographers, and, like this, it is very readily soluble in water. Sanocrysin, originally discovered as long ago as 1845 by two French chemists, Fordas and Gelis, was introduced into therapeutics in 1922 by Moellgaard. Most of us are aware that the latter has employed sanocrysin extensively in phthisis (giving it by the intravenous route), and its merits in the treatment of that disease have been keenly debated. Gold has also been much used in the treatment of the different forms of tuberculosis of the skin. In lupus vulgaris it has not proved very efficacious, but in the tuberculides and in lupus erythematosus it is a good deal more useful than any other form of therapy. Several different compounds have been employed. Martenstein was the first (in 1921) to employ krysolgan—an organic

[1] *Les Sels d'Or en Dermatologie et en Syphiligraphie.* Par F. Lebeuf et H. Mollard. Paris: Masson et Cie. (18 fr.)

compound of gold—in the treatment of lupus erythematosus, with good results, and since then other organic compounds have been contrived with a view to achieving greater efficacy and diminished toxicity. Perhaps the most important of these is solganal, which has been adapted both for intravenous and for intramuscular injection. Gold has also been employed in the treatment of syphilis and leprosy. Several writers have testified to its potency in this disease, and examples have been published of cases resistant to arsenic and bismuth which have yielded to one of the compounds of gold; there does not, however, seem to be much probability that it will ever oust salvarsan and its derivatives from the position which they occupy as the first line of defence against the *Spirochaeta pallida*. Further fields in which gold has been tried are leprosy and psoriasis. Here the results are not particularly striking, but it appears that some amelioration may follow the administration of sanocrysin in leprosy, and there are American dermatologists who allege that gold, and especially colloidal gold, is superior to arsenic in the treatment of psoriasis.

JENNER AND HUNTER

The Royal College of Physicians of London has recently acquired the following letter from Edward Jenner to John Hunter. It is dated Berkeley, March 4th, 1793, and addressed to Dr. Hunter, St. George's Hospital, London.

Dear Dr. Hunter,

I arrived quite safely home last night after a long and tedious journey. I passed the time perusing your paper on the blood, which you so kindly gave me on my departure.

I do not agree with your remark on organic bodies as being separate etc., nor on the stomach an organ most peculiar in animals for nutrition, circulation, respiration, etc. However, I will write you more fully on this subject.

I sincerely hoped that you had no return of the spasms during the night. We were discussing your museum last night, and I made claim to boast that it was the best of its kind in the country.

Your sincere friend,

E. JENNER.

In my haste when I left you I forgot Quincy's book. My dear old friend, will you forward same to me to the Bull Inn at Gloucester where I will call and collect it. I thank you Sir. March 5th, '93.

EFFICIENCY OF MERCUROCHROME AND OTHER ANTISEPTICS

The relative efficiency of mercurochrome has been a matter of controversy for several years; some workers have claimed that it is more effective than iodine in alcoholic solution, while others have found it much less effective. The experimental results recorded have been apparently irreconcilable. The Council on Pharmacy and Chemistry of the American Medical Association organized an independent investigation into the properties of mercurochrome and into the claim that the drug both penetrated the tissues readily and had local antiseptic properties due to surface fixation. The report[1] of the results of the investigation which has recently been published gives a brief summary of the extensive and contradictory literature and details of the new work which has been done. The most important practical result was obtained from attempts to sterilize the skin of patients before operation. An alcohol-acetone aqueous solution of mercurochrome was tried, together with various other standard disinfectants, but "these experiments with human skin had to be discontinued, because stitch abscesses occurred even after nine coats of mercurochrome, applied in intervals as described." This was held to confirm the view that mercurochrome has no bacteriostatic action, or very little, whereas mercuric chloride, iodine, and, to a less degree, gentian violet, show bacteriostatic properties. From experiments on the penetrative powers of mercurochrome, it was concluded that "mercurochrome cannot be relied upon to destroy bacteria that have penetrated into the living tissue of a wound or of the skin; it could do no more than disinfect the surface and the necrotic tissue. This limitation is shared more or less by all antiseptics, so that no substance can be properly called a safe and certain wound antiseptic." These conclusions seem to be fairly decisive, and to call for no comment.

[1] Reports on Comparative Studies of Mercurochrome and Other Antiseptics. Council on Pharmacy and Chemistry, American Medical Association. *Journ. Amer. Med. Assoc.*, July 9th, 1932.

BERNHARD BANG

Professor Bernhard Bang, whose death occurred on June 22nd, enjoyed an international reputation which was to a considerable extent earned by his work on tuberculosis in cattle and the system commonly known as Bang's system for the eradication of tuberculosis in herds of cattle. He was born on June 7th, 1848, and he brought to veterinary surgery a wide knowledge of general medicine and pathology. Not least among his gifts was his ability to surround himself with a group of younger men having great intellectual possibilities. His veterinary school was, in fact, a pioneer institution in the sense that Bang and his pupils created a standard which became a model not only for the neighbouring Scandinavian countries, but also for the world at large. Milk and meat control became measures of scientific efficiency in his hands. In 1896 he found the bacillus of infectious abortion in cattle, and was thus able to give a bacteriological basis to a campaign against this disease. It remained for his compatriot, Martin Kristensen, to show how great a part this same bacillus plays in Denmark in human beings. As has recently been pointed out by Dr. T. Madsen, the chief of the State Serum Institute in Copenhagen, Bang's system for the control of tuberculosis in cattle has practically stamped out this disease in some parts of Denmark, and has never enjoyed so great prestige as it does to-day. In February of this year, at a meeting of the Danish Tuberculosis Society, Bang was able to state that there were now enough tubercle-free herds to provide the whole of Copenhagen with tubercle-free milk. Other subjects with which Bang's name is associated, both in Denmark and abroad, are actinomycosis, tuberculin, and the bacillus of necrosis. He also played an important part in 1886 in introducing animal vaccination against small-pox in the place of vaccination from child to child.

The committee responsible for the publication of the *History of the British Medical Association* has decided that the copies now available on the termination of the Centenary Meeting may be placed on sale. The price at which they are to be sold is 4s. 6d. postage paid. Orders should be sent, with remittance, to the Financial Secretary and Business Manager, B.M.A. House, Tavistock Square, W.C.1.

THE SECTIONS

SUMMARY OF PROCEEDINGS

(*Continued from page 271*)

SECTION OF MEDICINE

Thursday, July 28th

CORONARY THROMBOSIS

With Sir THOMAS LEWIS in the chair, Dr. JOHN PARKINSON opened a discussion on coronary thrombosis. He referred briefly to the underlying pathological process—usually a thrombosis completing the occlusion of a coronary artery already obstructed by atheroma, with consequent infarction of the myocardium. It was most commonly seen in men over 40 and often enough in those who were apparently in good health, though many patients gave a history of attacks of anginal pain. The attack began suddenly—perhaps even in bed—with a dull heavy pain in the chest, attributed at first to indigestion, but the pain persisted and grew in intensity until the sufferer was in anguish of death. It extended to the back and down the arm, and was accompanied by sweating, possibly vomiting, and even fainting. If the patient survived the pain began to abate after two or three hours, and by the next day little was left. Slight attacks, however, might recur for two or three days. During the attack the patient was pale and restless, but the pulse was often normal and the breathing only little disturbed. Pain was the chief complaint, and sometimes gave rise to doubts as to the existence of some acute abdominal condition. Later there was commonly a rise of temperature and in some cases a pericardial rub. After the attack the blood pressure fell from shock, a reading of 100 mm. Hg being not uncommon. The end of the attack was but the beginning of a long illness shadowed by death or complications. Sudden death might occur at any stage—from heart failure in the first few days, or later from embolism. But, in fact, the average patient weathered the storm, and after the attack often felt so well that it was difficult to get him to stay in bed. A typical attack was easy to recognize, but minimal thromboses and attacks in patients already the subjects of cardiac disease were still difficult of detection. There were no typical physical signs, and the diagnosis must be made early on the symptoms and the history. The outlook was by no means so gloomy as was first thought, and if the patient survived the acute attack the natural expectation should be the recovery of a fair degree of good health, which might continue for years to come, a second attack being relatively infrequent. In treatment the first essential was relief of the pain by morphine, with digitalis later if signs of congestive heart failure appeared. A minimum of six weeks' rest in bed was essential, to be followed by at least three months' convalescence or longer before returning to active duties. Finally, Dr. Parkinson discussed the relation between angina pectoris and a coronary thrombosis, pressing for the acceptance of their essential unity. They were similar in the quality, site, and extension of the pain, and in their frequent concurrence and their common danger: this pointed to a common pathological cause, which was to be found in disease of the coronary arteries. He thought that too much stress had been laid on the gravity of angina of effort, and urged that many patients with angina still found life worth living and lived longer than was commonly supposed.

Sir THOMAS LEWIS discussed the pain in coronary thrombosis and angina of effort. The pain was the same in each condition, but in angina of effort the pain stopped when the effort stopped, whereas in coronary thrombosis it was continuous and lasting. The explanation of this was to be found in the work of Parry, and especially of Burn, in somatic muscle pain. If a tourniquet was placed round a limb and the muscle worked, pain ensued which eventually became intolerable; it was only stopped by relieving the vascular occlusion. Similarly, in angiitis obliterans the pain on effort was due to insufficient blood supply and stopped on cessation of effort. He suggested that the same picture was to be seen in the heart, and on this view one could explain the variation of pain seen in these conditions.

Professor W. T. RITCHIE (Edinburgh) described the symptomatology of the condition. It occurred mostly in men of the sixth to seventh decade and of all walks of life. The blood pressure was high; there had often been antecedent angina of effort, whilst some had had severe anginal attacks. There was radiating pain with severe anguish lasting for several hours. There was no characteristic attitude; usually the patient was still and afraid to move, but sometimes restless. The skin was cold, the face ashen-grey and bedewed with sweat. The pulse was often thin and rapid, due to the fall in blood pressure. In rare cases there was no pain; the breathing was shallow. After the second day there was often a little fever, maximal at 100–101° F. on the day when first recorded. Pericardial friction was heard on the second or third day in 10 per cent. of cases, but might vanish in a few hours. The syndrome might recur within the first three weeks. In patients who recovered there might be no physical signs after the attack, and they might pass as first-class lives. Here the electrocardiograph would help.

Professor W. E. HUME (Newcastle) in discussing differential diagnosis took pain and collapse as the two chief features occurring in cases for which coronary thrombosis might be mistaken. The severity of the pain was the same as in angina pectoris, but the duration was much longer. The aspect of the patient was different, for in angina the colour of the face did not change, the breathing was quiet and regular, and there was but little alteration in pulse or blood pressure. In coronary thrombosis no relief was obtained from nitrites. In some cases shock and collapse dominated the picture; and here the colour, the coldness of the extremities, breathlessness, and pulse often indicated the cardiac origin. Patients known to have had rheumatic heart disease rarely suffered from coronary thrombosis. There was a respiratory type of the condition like acute pulmonary oedema, which might be difficult of diagnosis. Difficulties also arose in the abdominal type—particularly in distinguishing it from gall-bladder attack.

Dr. CAREY F. COOMBS (Bristol) gave the result of his own experience in estimating the prognosis. On the whole, older patients tended to stand the attack less successfully. Women came out slightly worse than men in the immediate event. A history of antecedent angina of effort had no bearing on prognosis, which was slightly worse in the cases where friction had been heard. The pulse rate gave no reliable prognostic help, but he had found that the pulse pressure was the most valuable factor in assisting prognosis. His figures showed that when there was a low pulse pressure the prognosis was grave. Persistence of leucocytosis and fever were also serious. A good prognosis could never be given unless the patient was kept at rest for a sufficient time.

Dr. EVAN BEDFORD described the electrocardiographic changes. The first change was a deviation of the R-T segment, usually in opposite directions in Leads I and II. This was usually seen in the first week. The next stage was a deep inversion of the T-waves in Lead I (T_1 type) or in Lead III (T_3 type), but not in both. This was the

common characteristic change, but there were exceptions. In many cases the curve began to return to normal within a month, and in the course of years complete return to normal might occur. In addition there might be non-specific changes due to myocardial degeneration. The cause of the R–T deviation and the possibility of locating the damaged area were discussed.

Dr. JOHN HAY (Liverpool) pointed out that faintness might persist for fifteen to twenty minutes and be associated with convulsive movements: these cases might be mistaken for a cerebral lesion. He thought the dyspnoea had been unduly stressed ; in some cases there might be none. He would modify Sir Thomas Lewis's description of the pain as continuous by adding that it was of varying intensity, waxing and waning. In post-operative conditions the symptoms which were at first presumed to indicate a pulmonary embolism were not uncommonly due to coronary thrombosis.

Dr. OILLE of Toronto said that the diagnosis of coronary thrombosis was too stereotyped, causing many mild cases to be overlooked. In these there might be no pain, or possibly all sorts of pain ; and to avoid missing them all patients showing any sudden change in the heart condition should be put to bed and investigated for coronary thrombosis. Future attacks in these mild cases might perhaps be prevented by the removal of septic foci. Dr. JENNER HOSKEN, looking for an exciting cause of the coronary occlusion, suggested that it might be found in changes in the viscosity of the blood. He agreed with Dr. Carey Coombs on the importance of a low pulse pressure, but there was often great difficulty in obtaining the diastolic pressure. He believed venesection to be of value for congestive heart failure, and oxygen was helpful in cases with cyanosis.

Dr. E. STOLKIND said that in half his cases and those recorded in the literature it was impossible to make a correct diagnosis. In cases of the acute abdominal type a physician, not a surgeon, should be called in. He discussed the pathogenesis of angina pectoris. Professor VOLHARD (Frankfort), after referring to the chairman's contribution to the elucidation of the pain in this condition, advocated the use of an absolutely salt-free diet in the milder cases of angina pectoris.

A paper was read by Professor OLIVER K. WILLIAMSON (S. Africa) on arterial spasm as a cause of certain cases of transient paralysis of cerebral origin.

SECTION OF SURGERY

Thursday, July 28th

SPLENECTOMY

At a joint meeting of the Sections of Medicine and Surgery, with Sir HENRY NEWLAND in the chair, Lord DAWSON and Lord MOYNIHAN opened the discussion on removal of the spleen.

Lord Dawson affirmed his belief that only three diseases (excluding trauma and rare conditions such as tumours) warranted the operation of splenectomy—acholuric jaundice, purpura haemorrhagica, and splenic anaemia. Attention was drawn to the spleen as an area of concentration along the line of the reticulo-endothelial system rather than as an isolated organ, and to the hyperplasia of this system which followed splenectomy. This compensatory activity explained why in a few cases of acholuric jaundice the excessive haemolysis was not checked by splenectomy. In acholuric jaundice the enormous demand on the marrow resulted in its hyperplasia, with the formation sometimes of extramedullary nodules. Stress was laid on the necessity of assessing marrow function by complete examination of the blood before embarking on splenectomy. Splenectomy was indicated in all cases of acholuric jaundice in which the blood examination showed a capable and reacting marrow. The ideal age was about 12 years, before adhesions were present. It was pointed out that the essential features of the disease might not all be present. With biliary complications it was often a matter of dispute which should have priority in treatment, the gall-bladder or the spleen. Splenectomy was advocated as the first step, thereby allowing the marrow to recuperate and the blood to improve. A note of caution was raised on the use of blood transfusion before operation. References were made to cases in which, despite the utmost care in typing of the blood, agglutination occurred and death ensued. In purpura haemorrhagica the results of splenectomy were no less brilliant, but care must be taken in differential diagnosis. The disease was characterized by a history of recurrent bleeding, delayed retractility of clot, a diminished platelet count, and a positive capillary resistant test. Anaemia in purpura was proportional to the haemorrhage, and never profound as in aplastic anaemia, a disease which might be confused with purpura haemorrhagica, showing a thrombocytopenia and purpura. Blood transfusion was recommended in acute cases and also as a pre-operative measure, since after transfusion there was a rise in the platelet count. The experimental work of Bedson on the effect of splenectomy on the platelet count was referred to. The spleen destroyed blood platelets, and the removal of this organ improved the platelet count. After any operation, especially after Caesarean section and childbirth, there was some increase in the platelet count. The study of the platelet count following operation might throw some light on post-operative thrombosis and embolism. The high platelet peak corresponded in time relation to clinical thrombosis and embolism. The influence of light rays on the count was also mentioned. Splenic anaemia was referred to briefly, and Lord Dawson said that the outlook was not so good as in the two former conditions. Splenectomy benefited the anaemia but had little effect on the hepatic cirrhosis. Splenectomy was deemed worth while in any case in which there was no marked evidence of cirrhosis. The estimation of platelets furnished a good guide to prognosis, thrombosis being more likely with a high platelet count.

Lord MOYNIHAN gave an illuminating historic survey of the knowledge of the spleen and splenectomy. The slowly gathered experience of surgeons in many countries, ending with that of Spencer Wells in England, made it clear that this organ could be safely removed, that long survival might occur, and that no obvious disadvantages followed. The operation until recent years had been mainly reserved for rupture and laceration, torsion of the pedicle, mobile spleen, and prolapse. Of late, splenectomy had been performed for certain forms of anaemia and blood dyscrasia, and surgery once again had formed a strong arm of research. In malaria and syphilis splenomegaly was recognized as an encumbrance and a source of danger ; on account of injury and in view of the possibility that it was a factory for the growth of the parasite concerned in the disease its removal was indicated. The speaker, referring to splenic anaemia, said that the disease was slowly progressive, and, time allowing, was always fatal. Delay in operating added to the number and severity of pathological changes, to the technical difficulties of operation, to the likelihood of haemorrhage after operation, and to the mortality. Splenectomy should be performed as soon as possible after the diagnosis was established. Even in advanced cases removal of the spleen lightened the load on the liver, and the liver cells made haste to regenerate. Pre-operative treatment was of paramount importance ; *x* rays or radium should be used for gigantic spleens, and repeated blood transfusions were indicated in cases of severe anaemia. In advanced

cases successful operation did not free the patient from further trouble, since severe haematemesis might occur later, and the question of ligature of the coronary vein or the performance of Rutherford Morison's operation might be considered. The mortality was between 6 and 12 per cent. Haemolytic jaundice was next discussed. These patients were often, as Shaufford said, "more jaundiced than ill," there being persistent acholuric jaundice with splenic enlargement in all cases. Severe crises occurred from time to time in the disease, and secondary changes in the biliary system developed with the formation of gall-stones. Splenectomy in these cases caused the jaundice to disappear in about twelve days or, rarely, slightly longer, but in most cases fragility of the red cells persisted. Early operation was easy and safe, and its necessity in all cases was emphasized owing to the secondary changes in the biliary system, with possible obstruction to the common bile duct. The mortality was approximately 3 per cent. The last condition considered was purpura haemorrhagica. The difficulties in diagnosis were referred to, and splenectomy in chronic cases was considered the most satisfactory procedure. Acute cases were usually fatal. The mortality was due to the patient's condition before operation and not due to the operation. In conclusion, the importance of pre-operative preparation was again emphasized, and Lord Moynihan said that the operation rarely presented any technical difficulties except in advanced cases of splenic anaemia. The tail of the pancreas should be carefully avoided when ligaturing the pedicle.

Dr. J. W. McNEE referred to the difficulty of obtaining accurate statistical results of splenectomy in this country without pooling them. It was the discovery of an enlarged spleen which initiated the clinical problem as a general rule, except in cases of purpura haemorrhagica, where this organ was within normal limits of size. Splenic enlargement was discoverable in a number of ways. It might show itself by its size, by the pain of perisplenitis, by jaundice, by haematemesis, or by accident. A whole series of investigations were necessary to establish a diagnosis. Infective endocarditis, Addisonian anaemia, Hodgkin's disease, and acute, and most of the chronic, leukaemias were positive contraindications to splenectomy. He had deliberately omitted reference to tropical diseases. The speaker agreed with the openers that early splenectomy at a chosen time was the best treatment for acholuric jaundice. The difficulties of diagnosis and pathological classification in the different varieties of splenomegalies of unknown aetiology were then considered. The problem of advising for or against splenectomy in these conditions was equally difficult. Either a diagnosis of primary hepatic cirrhosis with splenomegaly or of one of the types of splenic anaemia might be, in suitable cases, an indication for splenectomy, but the result and rationale of the result might be expected to be different in the two sets of circumstances. At present, splenectomy was often the only hope of prolonged life to offer many of these patients. The difficulty and possibility of distinguishing the results of surgical intervention must be to some extent a lottery. He had had amazing results from splenectomy in desperate cases, and also disappointing failures. He said that no case was too advanced for splenectomy. Dr. McNee, discussing the results of splenectomy, said that the only difficulties he had noted as an interested watcher at operations had been dense adhesions, and he wondered in these cases whether the surgeons might consider ligature of the splenic artery. Complications of the operation which specially interested the physician were widespread venous thrombosis and haematemesis. In conclusion, Dr. McNee said that, though in many cases of splenectomy the blood count returned to normal, in many others it remained at a low level, the patient nevertheless feeling well. The development of primary carcinoma in two female patients at unusual situations and at an unusually early age were referred to following splenectomy for splenic anaemia. In the speaker's experience there was no evidence whatsoever that following splenectomy the resistance of patients to infections was diminished in the least degree. Colonel Sir FRANK CONNOR (Bombay) dealt with some facts regarding splenectomy in the Tropics, with special reference to the treatment of splenomegaly. An enormous amount of material was available, but owing to the chaotic state of classification it was rarely referred to the surgeon, and then often too late. India was the land of ruptured spleens, and movable spleens were common in the Tropics. Cases were seen with haemorrhagic cysts undergoing abscess formation, probably the result of malaria. A most interesting analysis of 1,200 cases of splenomegaly among 3,308 consecutive necropsies in hospitals in India and Burma was made. From the surgical point of view an important class was the "splenic anaemia type"—mostly of unknown aetiology. Some of these might be post-malarial or post-kala-azar. The speaker put forward a strong plea for closer collaboration between the physician, the surgeon, and the pathologist. The possibility of ascertaining the presence and extent of adhesions before operation was mentioned, and the possibility of dealing with such adhesions by means of the diathermy current.

Professor D. P. D. WILKIE (Edinburgh) said that the indications for splenectomy had been very clearly stated. Three main dangers of operation were haemorrhage, mesenteric thrombosis, and pulmonary complications. The first of these was the result of faulty technique, especially to a failure to mobilize the spleen. In his experience adhesions to the diaphragm were not a common source of difficulty. In rare cases, when adhesions were extensive, ligation of the splenic artery as a sole procedure or as a first-stage operation was probably the wisest course. Anaemia should be dealt with by transfusion unless there was a very high reticulocyte count. Mesenteric thrombosis was a real post-operative danger in cases of splenic anaemia in which the platelet count prior to operation was normal or about normal. A low platelet count in splenic anaemia and a high reticulocyte count in haemolytic anaemia made for safe and successful splenectomy. The commonest chest complication in Professor Wilkie's experience was pleurisy with effusion. The use of the sitting position and inhalation of CO_2 was a help in guarding against pulmonary complications. The speaker, referring to the results of splenectomy, said that in purpura and acholuric jaundice the immediate results were brilliant and usually lasting. In splenic anaemia, however, the results were much more variable. In his experience of splenectomy in splenic anaemia improvement might be anticipated, and in over 50 per cent. complete economic fitness would be restored. The expectancy of life in such persons was, however, as yet undetermined. Splenectomy was justified in every case provided a thrombocythaemia was not present.

Mr. A. J. WALTON said that of the pathology of splenic enlargements they knew nothing, and of the function but little, except in certain diseases. Splenectomy in some cases of congenital syphilis and tuberculosis of the spleen was considered, and the speaker said that there was a good field for splenectomy in malaria and kala-azar. The irregular function of the spleen in regard to red blood cells was mentioned. Cases of children suffering from tubercle of the spleen with polycythaemia were cured by splenectomy. He agreed that there was great difficulty in the classification of the splenomegalies associated with cirrhosis of the liver. Acute cases of purpura haemorrhagica should never be operated upon. Dr. H. P.

GILDING (London) said that experimental work had shown that splenectomized animals were less resistant to CO, and that the spleen could hold one-tenth of the red cells of the body. He pointed out that the red cell count was increased in countries where there were most motor cars, probably because of the exhaust gases. It was conceivable, therefore, that there was a danger in removing the spleen of a patient likely to come in contact with CO. He issued a strong plea for the closer association between the physiologist and the physician. ALI IBRAHIM PASHA (Egypt) drew attention to the geographical distribution of splenomegaly in Egypt. The area where it prevailed coincided exactly with the area infested by the *Bilharzia mansoni*. The clinical picture of these cases was ably described. Referring to results of operation, the speaker said that the improvement of health more than compensated for the risk of the operation. Professor L. S. P. DAVIDSON (Aberdeen) said that the difficulties of diagnosis were greater than many people thought. The distinction between achlorhydric microcytic anaemia and early splenic anaemia was extremely difficult, and it must be remembered that there was a big group of haemolytic anaemias, with large numbers of reticulocytes in the blood, which were not cases of acholuric jaundice. Until all the results had been pooled and investigated he would not be prepared to say that operation was justified in this group. He agreed that splenectomy was the correct procedure in true acholuric jaundice. Gall-bladder disease, in his opinion, was a cause of splenomegaly. Dr. DOROTHY HARE was of the opinion that simple achlorhydric anaemia and Hodgkin's disease with predominant splenomegaly should be excluded from the "splenic anaemia" group. Regarding the selection of cases for operation, the value of the platelet count was stressed. The preoperative study of liver function tests was also mentioned. A case was quoted in which the liver changes seemed to have preceded the splenomegaly. Professor SHEEN (Cardiff) said that in his experience of splenic anaemia the ultimate prognosis in the presence of hepatic cirrhosis, particularly when advanced, must be guarded. A case of congenital syphilis with enlarged spleen had been dealt with by splenectomy, since when the Wassermann reaction had become negative, whereas previous to operation treatment had failed. Splenectomy in a case of tuberculosis of the spleen was also quoted. This case was clinically typical of advanced splenic anaemia. The patient was now well three and a half years after operation. Splenic anaemia did not seem to be a disease entity, but a symptom-complex. Splenic anaemia had no special pathology. For myelocytic leukaemia splenectomy was not any good, but prolongation of life and symptomatic improvement was possible. Two cases of splenectomy for purpura haemorrhagica were described, and it was stated that in undoubted cases splenectomy was a cure. With Hodgkin's disease splenectomy was of no value. Dr. A. R. PARSONS (Dublin) showed pictures of three generations of cases of acholuric jaundice treated without surgery. He thought that surgery was unnecessary. Dr. FREER quoted a case in which he had performed splenectomy for ruptured spleen, and in which Mr. McAdam Eccles some years later, while operating for the repair of a ventral hernia, had apparently found a perfectly normal spleen.

SECTION OF OBSTETRICS AND GYNAECOLOGY

Thursday, July 28th

TREATMENT OF UTERINE CARCINOMA

At the second meeting of the Section, with Sir EWEN MACLEAN in the chair, a paper on the treatment of carcinoma of the uterus was read by Dr. A. LACASSAGNE (Paris). He confined himself to the statistics of the Institut du Radium de Paris. Between 1919 and 1926 678 patients had been treated, of whom 182 (26 per cent.) were alive and free from all symptoms of cancer five years after treatment. He outlined the technique employed, in which tubes were placed end to end so as to fill up the cervical canal. The total dosage from a continuous application lasting five or six days rarely exceeded 8,000 mg. hours. From 1924 onwards this application had been reinforced by external irradiation, either by means of *x* rays or by means of a powerful radioactive source situated 10 cm. from the skin and consisting of 4 grams of radium element, the radiations from which were applied through several fields. Analysis of this result showed a progressively larger number of cures as the technique improved. They hoped soon to have an 8-gram bomb for use at greater distances than 10 cm. in place of the present 4-gram bomb. The immediate mortality from gynaecological radium therapy was due entirely to infection and hardly amounted to 2 per cent. In a much greater number of cases irradiation set on foot infective processes which interfered with treatment and necessitated its interruption for a time. Radium therapy became impossible when uterine cancers became heavily infected.

Professor FRIEDRICH VOLTZ (Munich) spoke on the radiotherapy of carcinoma of the uterus, with special reference to *x*-ray treatment. He said that since 1912 Döderlein had treated every patient admitted to the Munich clinic by radiotherapy alone. The number of cases treated in twenty years had amounted to 3,000, and his experience had enabled him to assert definitely that radiological treatment did everything that radical surgery could do. It was less dangerous and less drastic; and, moreover, it would be of use when operation was impossible. Between 1913 and 1926 inclusive 1,723 cases had been treated, and 319 patients were alive and well after five years—that is, 18.5 per cent. Between 1924–6 the number of patients treated was 404, and 97, or 24 per cent., were alive and well after five years. Comparing these figures with the results of operation he was of opinion that exclusive radiotherapy was the only method worthy of consideration, and it should be employed in every case. From 1913 to 1926 107 patients with carcinoma of the corpus uteri were treated by radiotherapy alone, and of these 49, or 45.8 per cent., were alive and well after five years. He contended that the figures fully justified the treatment of all cases of carcinoma of the uterus by radiotherapy alone. To obtain the results he had shown with radiotherapy it was necessary for the clinic to have: (1) at least 100 mg. of radium element per case, (2) efficient and modern *x*-ray apparatus, (3) every modern device for exact dosage, and (4) well-trained and reliable personnel. All these patients were treated by a combination of radium and *x* rays. Professor Voltz outlined the technique and course of treatment given. This included in each case a preliminary irradiation of the pituitary, which improved the general condition and was also believed to increase the sensitivity of the carcinomatous tissue. Regularity in after-observation was as important as regularity in treatment, in order that recurrence should be detected and fresh treatment carried out in good time. He explained the careful follow-up measures in vogue at the Munich clinic.

Mr. VICTOR BONNEY discussed the surgical treatment of carcinoma of the cervix. He said that between May, 1907, and May, 1927, he had performed Wertheim's operation 339 times; 52 patients had died of the operation; 135 had died of recurrence before five years; and 132, or 41.3 per cent., were alive and well after five years. Of the 339 cases invasion of the regional glands had been present in 143 (42 per cent.). In the gland-invaded group the operative death rate was 21.6 as against 10.7 per cent. in the non-invaded group. The relative

cure rate of the gland-invaded group was only 23.7 per cent. as against 50 per cent. in the non-invaded group. He reckoned his operability rate at 63 per cent., giving an absolute cure rate of 24.5 per cent. Mr. Bonney then analysed his cases on a basis of ten years' freedom from recurrence, the absolute cure rate being 19.1 per cent., or with deductions, 20.8 per cent. He demonstrated that the operation death rate in his series had fallen from 20 per cent. in his first 100 operations to 9 per cent. in the last 128. If they formed their statement on the ten-year basis, then they could say that the operation cured one out of every five patients seen and one out of every three patients operated on.

Dr. Gray Ward (New York) said that in the United States they looked for guidance to the great European centres of radiotherapy. But in addition to the great centres radiotherapy must be available in the general and special hospitals. The gynaecologist must therefore be competent to carry out radium treatment properly. Their technique was based on that of Paris and Stockholm. They endeavoured to build up their patients' general condition before treatment. When recurrences were discovered re-radiation was performed. Since 1929 high-tension x rays as well as radium had been employed. They had treated 96 per cent. of cases seen. The primary mortality of all cases treated was 1.1. Their absolute cure rate was 23.8. In their cases there were nineteen of cancer occurring in the stump after supravaginal hysterectomy. The figures of all clinics appeared to give a cure rate of 25 per cent., both for operation and for radiotherapy. As regards operation *versus* radium there was a very large number of advanced cases in which there was no hope from surgery. There was practically no primary mortality from radium therapy. They could not hope for much improvement in surgery, whereas there was every right to hope for better results from radiotherapy.

Dr. Elizabeth Hurdon spoke of their experience at the Marie Curie Hospital. The technique had been based on that of Stockholm. The number of their cases was still too small for statistical purposes.

Dr. Malcolm Donaldson advised all the younger generation of gynaecologists to spend a year at the Radium Institute in Paris. He did not think that in a short time the public would tolerate an operation with a mortality rate of 10 per cent. when radium offered so many advantages. The problem now was the treatment of the glands, not that of the primary growth. He emphasized the importance of early diagnosis.

Dr. G. I. Strachan (Cardiff) said that out of 300 cases 225 had already passed beyond any hope from operation when first seen. Symptoms were no guide to the extent or stage of the growth. The majority of patients could be treated by radium. In no case should radium be inserted if the red cells were below 3,000,000 per c.mm. In an extremely few instances radium appeared to do harm. In their cases 10 per cent. developed fistulae before death. The extent of the disease in carcinoma of the corpus was very difficult to determine. Recurrences in the earliest stages were susceptible to radium; in the later stages they were more resistant. Dr. Robert Fowler (Melbourne) said that he still placed surgery as the first choice in carcinoma of the corpus. For the cervix he emphatically placed radium as the first choice. Routine speculum examination was of great importance for the early detection of primary disease or recurrence. Colonel Spencer Mort said that he employed first radium and followed this with deep x rays. Their method was a modified Stockholm technique. He did not think that cancer propaganda presented such a difficult problem. Periodical examination could be popularized just as was regular examination of the teeth. Dr. Mabel Ramsay (Plymouth) thought they should aim to collect statistics over twenty or twenty-five-year periods. She was of the opinion that the leucorrhoeas should be more seriously treated. Dr. Maliphant (Cardiff) thought that when carcinoma had spread outside the cervix the results from radium alone compared very unfavourably with combined radium and deep x-ray therapy. Professor Wessels (Cape Town) believed that it would be easier to give an adequate training in radium technique than in surgical measures, and with the results now obtainable radium should become the method of choice. Professor Lowry (Belfast) said that he had been loath to abandon the Wertheim operation in favour of radium. He still thought that there were cases where the Wertheim operation was justified. Radium reinforced by deep x rays was his method of choice. Adequate preparation was of supreme importance. Most of his patients were given one or two blood transfusions. He was struck with the frequency with which dental sepsis occurred in his cancer cases. He agreed that there should be more serious treatment of leucorrhoea as a preventive measure against cancer.

The President remarked that he had been perfectly satisfied with the results of the Wertheim operation. He could not add any valuable information about radium. They knew what operation could do, and surgery had about reached its limitations, but they did not know yet the extent of what radium could do. He believed in the end that radium would do more for cancer than surgery. The public would prefer it, and more skilled radium technicians should be available than there were skilled operators. Professor Lacassagne agreed that it did not take long to teach the adequate technique of radiotherapy. Mr. Victor Bonney, in reply, said that the real issue lay between the man who used radiological methods alone and the man who used surgical and radiological methods. It was most difficult to contrast two methods each of which had its uses in certain circumstances. He was certainly not unsympathetic to radiation. It was the extension of disease to the glands which presented the real difficulty to the radiologist. Operation did offer a chance when the glands were involved. When radiation reached the glands, especially those in the obturator fossa, and dealt effectively with them, he would abandon surgery. Radiation was an easier thing to learn than surgery.

SECTION OF DERMATOLOGY AND VENEREAL DISEASES

Thursday, July 28th

Venereal Diseases in Women: Modern Treatment

Dr. H. W. Barber took the chair. Mr. Johnston Abraham opened the discussion with a paper printed in full last week at page 237.

Colonel L. W. Harrison observed that the preponderance of female children with manifest congenital syphilis suggested that syphilis killed more male foetuses and infants than female, and that femaleness began to protect long before puberty. With regard to gonorrhoea in the female the great importance of having all abnormal discharges examined bacteriologically (he condemned naked-eye examination as futile) could not be too strongly emphasized. Statistics in most countries showed that for every woman under treatment for gonorrhoea there must be at least one other going untreated, and unless this were remedied we should make little progress against the incidence of gonorrhoea. Practitioners and nurses could help very greatly in the campaign against gonorrhoea by instructing their patients that the gonococcus commonly caused few or even no symptoms in females. With purposive treatment gonorrhoea in women was not the hopeless business many believed it to be, though it was

often succeeded by a very intractable cervicitis. Dr. Anwyl-Davies said that the cervical chancre, which was the site of inoculation in at least 44 per cent. of cases, was the greatest cause of the spread of syphilis. His course of anti-syphilitic treatment at the Whitechapel Clinic was founded on spirochaete experiments. Its success and low percentage of complications was due to: (1) bi-weekly intravenous, alternating with deep subcutaneous, injections; (2) dosage maintained but not increased; (3) only one rest interval; (4) bismuth exhibited simultaneously with arsphenamine. Dr. Assinder (Birmingham) said that the main objective was to prevent acute venereal disease becoming chronic; this depended upon two factors—early and correct diagnosis and early and efficient treatment. He regarded the prognosis in acute syphilis as extremely good, provided that proper treatment was given and that the patient could tolerate such treatment. Probably the most significant test for intolerance was the presence of urobilinogen in the urine. In gonorrhoea the diagnosis was often more difficult in women than in men. In all doubtful cases Gram-negative cocci should be cultured and identified. The complement-fixation test was valuable in cases of suspected gonorrhoea. He advised in the treatment of gonorrhoea routine daily application of non-irritating antiseptics, such as 5 per cent. monsol in glycerin. Cure, however, depended on the resistance of the patient herself, and in spite of local treatment the condition might become chronic in some cases. In these he recommended stimulation either by diathermy locally or by intravenous vaccine. Dr. Margaret Rorke discussed the treatment of pregnant women first seen at about four months' pregnancy with symptoms of secondary syphilis. She urged the necessity for further treatment of the infants born of these mothers, quoting cases to support her statements. She also discussed the question of chronic gonorrhoea in pregnancy.

Mr. David Lees (Edinburgh) read a paper on ophthalmia neonatorum. He enumerated the requirements of any administrative action aiming at the prevention of ophthalmia and its successful treatment as follows: (1) Facilities for diagnosis and efficient treatment of every case of gonorrhoea in the adult. (2) Facilities for investigation during the ante-natal period of any urethral, vaginal, or cervical discharge, and for appropriate treatment. (3) Compulsory prophylaxis of the eyes at birth by doctor or midwife, with an antiseptic which does not irritate but is sufficiently strong to kill the gonococcus. (4) Immediate bacteriological examination of any discharge from the eyes during the first twenty-one days of life. (5) Facilities for hospitalizing both mother and child. (6) An ophthalmologist should be available for consultation. (7) The medical officer of health should have the power to investigate the source of infection. (8) Every teaching school should provide for the practical teaching of students and midwives on prophylaxis and treatment. Although much had been done to reduce the incidence of the infection since Crede's work was published over fifty years ago, there was still room for improvement in our preventive measures. The fact that ophthalmia had not been stamped out or at least reduced to negligible proportions as in Denmark was in some ways a reflection on the profession and showed that not all doctors practising midwifery nor all maternity hospitals had as yet utilized to the full the possibilities of preventive medicine.

Dr. P. B. Mumford (Manchester) read a paper entitled "Acne, a symptom, not a disease." He regarded acne as a disease of varied aetiology. Preliminary investigation of 100 cases in the young adult female had been made. Particular attention had been paid to racial, social, and physical types. He drew attention to the correlation in acne of sebaceous activity, circulatory changes, alimentary dysfunction and menstrual disorder; and referred also to dental caries, and peripheral sudorific activity. Acne would appear to be a symptom of general metabolic change occurring more commonly in persons of a certain physical type and mode of life.

Dr. G. B. Dowling (London), in a paper on the infective eczemas of the scalp, said that there were four distinct varieties of eczema of the scalp which should be classed as infective—namely, primary eczema of the scalp in infancy, impetigenous eczema in children and adults, *fausse teigne*, and seborrhoeic eczema. Great care was necessary in the differential diagnosis of these conditions, since without a correct aetiological diagnosis, rational treatment could not be instituted. Of the conditions reviewed by far the most important was impetigenous eczema in children. He laid stress on the importance of bad housing conditions as a causal factor in this serious disease, and, as a corollary, on the value of fresh air and natural sunlight in its treatment—the only rational therapy.

SECTION OF COMPARATIVE MEDICINE

Thursday, July 28th

Aetiology of Dental Caries

The chair was taken by Sir Frank Colyer, one of the vice-presidents, and a discussion on the aetiology of dental caries was opened by Dr. E. W. Fish. He divided clinical caries into four types: fissure, interstitial, cervical, and recurrent (after fillings) caries. Each type, he said, started in either a permeable crevice or a faulty area of the tooth surface. He considered that all the evidence pointed to the disease being a saprophytic phenomenon occurring in such localities. In no case could it be prevented by vital reaction on the part of the formed tooth, although its extension might be delayed. Prevention seemed to be possible only by rendering the mouth unsuitable for the saprophytes or by breeding a race free from morphological crevices and developmental faults and whose gums would never recede.

Mrs. May Mellanby (Sheffield), also an opener of the discussion, said that she considered that fat-soluble vitamins (especially D) were essential for calcification of the teeth and for resistance to disease. Natural foods containing vitamin D were comparatively expensive. Cereals were not only devoid of vitamin D but contained some toxamin which tended to hinder calcification, and the greater the part they played in the dietary the greater must be the intake of vitamin D and calcium to antagonize their effect. She believed that, while the liability of the tooth to decay depended on many factors, the structure of the tooth was one of the highest importance. This in turn depended on the diet during growth; after eruption resistance to caries could be influenced by dietetic conditions. Hyperplastic teeth were more liable to decay than normal teeth, and it was necessary to concentrate on the development of more perfect teeth and upon increasing their resistance to decay.

Dr. Warwick James criticized the view that caries could be explained by reference to dental structure, which was at most a limiting factor. The immediate cause was to be sought in the bacterial flora of the mouth, and in particular he emphasized the importance of *B. acidophilus*. Dr. I. H. Maclean believed that the primary cause was an enamel fault, the causal organism being yet undetermined. Simian caries appeared to be identical with human caries. Dr. F. W. Broderick (Bournemouth) believed that the balancing of the metabolic equation was a main factor in the aetiology, pointing out that it was not a disease entity, but rather a symptom of a general constitutional disturbance. It was necessary to postulate that caries and pyorrhoea were opposite and antagonistic,

which, however, was not entirely accepted. Mr. J. G. Turner discussed caries from the clinical point of view, believing that general carbohydrate stagnation was the one factor beyond doubt, although there must be others. He found that enamel caries spread no more rapidly in hyperplastic than in normal areas, and that both caries and pyorrhoea could occur simultaneously. Dr. E. C. Sprawson considered that protection could be obtained in three ways: by form and spacing of the teeth, by the physical character of the food, and by an immunity induced by raw milk. Dr. T. Hare, M.R.C.V.S., considered that insufficient attention had been paid by investigators to the disease in animals, and that the problem could only be solved by controlled experimentation. Dr. Kathleen Vaughan was convinced of the value of sunlight as a factor in the prevention of both caries and rickets, being more important than diet.

Sir Frank Colyer urged a broader view of caries. He had found that the disease was commoner in captive than in wild monkeys. In captive animals it always occurred where food lodged, while in wild monkeys it followed trauma. Monkeys which normally fed on a vegetarian diet were free from caries in the wild state, although their enamel was not highly calcified. He believed that caries in captive and domestic animals was due to the inclusion of fermentable carbohydrate in the diet. Mrs. Mellanby and Dr. Fish briefly replied to the discussion.

Arthritis in Horses

Mr. W. M. Mitchell, M.R.C.V.S., presented a paper on chronic arthritis in horses, the common form of which showed conditions exactly analogous to those found in osteo-arthritis in man. A variety of different clinical conditions in equines appeared to be merely different manifestations of the same disease, which was also commonly accompanied by lesions in the peripheral nervous system. The cause was obscure, but he suggested that it should be looked for in housing, bacterial or worm infections, and in diet. Mrs. Mellanby and Dr. Hare took part in the discussion which followed.

SECTION OF RADIOLOGY

Thursday, July 28th

Radiations in the Treatment of Inflammation

A discussion on the treatment of inflammatory conditions by radiations was opened by Dr. J. H. Webster, Dr. N. S. Finzi being in the chair.

Dr. Webster, speaking of acute inflammations, said that Heidenhain and Fried stimulated research on this subject by their report on 243 cases in 1924. Since then many conditions had been treated, and Seeman had published results in 171 cases, including axillary abscess, kidney and appendix abscess, and acute mastitis. As to the mode of action of radiations, recent experiments had shown that micro-organisms were destroyed, an action which had previously been denied by many. In addition, there were marked effects on the tissues—effects somewhat closely resembling inflammation. The poor results obtained by Maximoff were due to too large doses, and the effect of smaller doses should be studied. With regard to chronic infections, actinomycosis reacted well, but it was in tuberculous lesions of all kinds that the greatest success had been attained. Dosage must be small in order not to destroy the tubercle, which was a defence mechanism. In the case of cervical glands he (the speaker) usually gave one-sixth of an erythema dose at weekly intervals. Indolent surgical sinuses often reacted very well to x rays, as also did chronic nasal sinusitis. Of the skin diseases acne and the eczemas responded well, and small doses of one-sixth of a skin dose were usually given at weekly intervals. The effect of x rays on enlarged tonsils in children was so satisfactory that he believed that it would in time replace operative methods. It was not so efficacious in adults, where fibrosis was common. X rays were to be preferred to radium. In the treatment of gastric and duodenal ulcer the field was widening, and it was possible to alleviate pain and tenderness, to improve the appetite, and increase the weight in those patients not benefiting by medical treatment. Pelvic inflammations in women, especially those due to tubercle, could be cured, as Uter and Sippel had shown. Ocular inflammation, such as keratitis and irido-cyclitis, did well with small doses. An important sphere was that of the preliminary treatment by x rays of sepsis associated with malignant disease.

Dr. J. E. A. Lynham said that radiologists were judged and condemned on their success with malignant disease, and were not given credit for the results in such conditions as enlarged tonsils and tuberculous adenitis. He thought that the course of treatment for the former condition could be given in one week, and that in adenitis treatment should be continued after disappearance of the glands. In arthritis, treatment should be continued after relief had been obtained. Dr. Webster had not mentioned ultra-violet-light radiation, but he (the speaker) thought it was very valuable in many conditions, both in a local and in a general form. Dr. W. Hope Fowler said that he had had excellent results in tuberculous glands, but he used rather larger doses than Dr. Webster. He had treated nasal sinusitis with success and had found that chronic osteomyelitis often reacted favourably. In rheumatoid arthritis x rays caused disappearance of swelling and relief of pain. He had seen cases of encephalitis lethargica definitely improved. Dr. W. M. Levitt said that accuracy of dosage had made it possible to treat increasing numbers of conditions with x rays. Success in treatment of tuberculous adenitis had only come since this accuracy had been made possible. He did not believe that x rays in therapeutic doses were bactericidal, or that the increased production of fibroblasts was other than a normal process. X rays caused a beneficial reaction akin to inflammation over a wide area, and the aim in inflammatory conditions was to maintain this reaction and at the same time to avoid damage to the normal tissues.

During the discussion which followed Dr. Hernaman-Johnson showed the charts of three cases of erysipelas of the face and scalp. One had been treated by ordinary medical means, and the other two by small doses of x rays. The latter showed an immediate fall of temperature and an improvement in the general condition within twelve hours. He agreed with Dr. Webster that in osteo-arthritis no improvement in the radiographic appearances could be detected after x-ray treatment. Relief was due to the action of the x rays on the inflamed soft parts. He had been indebted to Dr. Lynham for supporting him in the advocation of ultra-violet light in combination with x rays.

Other Papers

Dr. A. Bruce MacLean (Glasgow), in a paper on the gastro-ileal reflex in appendicitis, said that the inhibition of the gastro-ileal reflex was a reliable sign of appendicitis. Of 300 patients examined by this method, in forty of whom operation findings were available, all were found to have chronic appendicitis, and in more than half the gastro-ileal reflex was inhibited, so that this absence of the reflex as shown radiographically was diagnostic of chronic appendicitis. Dr. L. A. Rowden (Leeds) read a paper on radiographic pelvimetry. He said that the pelvis of every woman should be measured by radiographic means early in the first pregnancy. Dr. Rowden described his method in detail, and showed several films of pelves taken in this way. Measurements were accurate to within less than one-eighth of an inch, and this could not be

claimed by any other method. Dr. C. G. TEALL (Birmingham) read a paper on intravenous urography in children. He said that the disadvantages of retrograde pyelography in children were many and evident, and the introduction of uroselectan by Swick in 1929 had proved a very great advantage in the investigation of renal disease in children. The indications for pyelography were much the same as in adults, but it was of particular value in the investigation of pyuria, especially when it existed in connexion with congenital abnormalities.

SECTION OF OPHTHALMOLOGY

Thursday, July 28th

VARIOUS PAPERS

The chair was taken by Dr. PATON (Perth, Australia), who thanked Sir John Parsons and Mr. Duke-Elder for arranging the physiological demonstrations at University College on the previous afternoon.

Dr. R. A. KERRY (Montreal) read a paper on the ciliary circulation, in which he showed that aqueous humour passed from the eye to a greater extent by the vorticosae than by the canal of Schlemm. The amounts absorbed by the veins from interstitial fluid and from the aqueous humour had not been determined. The effect of colloid absorption on circulation had not been given due weight, and the extent to which it modified other factors which had been accorded more prominence would have to be carefully studied. Sir JOHN PARSONS said he could not accept conclusions not based on actual experiments, and said it had been disproved that the venous pressure was higher than the intraocular pressure.

Dr. W. CAMAC WILKINSON's paper was on the diagnosis and treatment of tuberculous disease of the eye. He said he had been trying for years to interest ophthalmologists in this subject, but without success, until he lately had the help of Mr. C. L. Gimblett, which had enabled him to prove conclusively the value of tuberculin as a diagnostic and curative agent. Tuberculin rarely allowed any mistake in diagnosis, and might work wonders in treatment, but the treatment had to be in the hands of an expert. He insisted that in all obscure lesions of the eye, haematogenous infection by tubercle should first be excluded. He was confident that anyone visiting the tuberculin clinic would be thoroughly convinced of the truth of his views on this subject. Dr. KERRY (Montreal) suggested treatment by injection of iodine in oil. Dr. HALLIDAY SUTHERLAND said he believed in tuberculin, which was now coming into its own after 40 years' neglect. Mr. GIRI (Eastbourne) and Dr. PATON (Perth) also spoke.

Mr. R. A. GREEVES read a paper on temporary changes in the refraction of the eye in diabetes. He reported two cases which he had recently seen, where there had occurred a marked change in the refraction without any observable change in the lens. On investigation the patients were found to be diabetic. It appeared that a change in the direction of myopia took place during hyperglycaemia, and in the direction of hypermetropia during hypoglycaemia. Astigmatic changes might also occur. The probable explanation was a transient change in the refractive index of the lens, depending on changes in the amount of fluid in the lens substance. Mr. ADAMSON (Hove) said he was especially interested because he had seen such a case on the previous day, the patient having become hypermetropic.

Mr. F. A. JULER read a paper on aspiration of the vitreous. The indications for the operation were vitreous haemorrhage from trauma, vitreous opacities from uveitis and retinitis, and acute infection from perforating wounds. The site of election was 6.5 mm. from the limbus, downwards and outwards, and the usual amount of fluid withdrawn was 0.4–0.6 c.cm. He reported two cases of vitreous haemorrhage in which vision had been reduced to perception of light, and in which aspiration had resulted in an improvement of vision to 6/6. Squadron Leader LIVINGSTON referred to experimental work he had done in transplanting vitreous from one animal to another.

Mr. D. V. GIRI (Eastbourne) read a paper on ophthalmology in general practice, in which he referred to the common eye diseases and injuries likely to be met with. He emphasised the value of immediate milk injections in perforating injuries, before sending the patient to a specialist. Squadron Leader P. C. LIVINGSTON, R.A.F., gave an exceedingly interesting account of clinical researches which he had carried out in Iraq, in an attempt to determine the effect of glare on the eye. Many of the men who had been in the Tropics for some time developed arcuate scotomata in the field of vision, and had their light sense greatly reduced. He demonstrated an apparatus which he had devised for measuring the light sense. Dr. HARRIS (Port Elizabeth) gave an account of the conditions in South Africa. Dr. GORDON SPENCER (Baghdad) said that glare could produce vomiting and a condition simulating an acute fever.

Sir JOHN PARSONS laid stress on the great complexity of the subject, which recent laboratory work had only succeeded in making more complex still. Mr. N. BISHOP HARMAN demonstrated the projection scotometer, which had the advantage that the patient saw nothing of the instrument or the surgeon, but only the fixation spot and the moving spot, which were projected on to a screen in front of him. It had the disadvantage that the surgeon could not watch the patient's eye.

Dr. W. H. SIMPSON (New Zealand) gave a short paper on subscleral injection, the object being to inject an irritant fluid between the sclera and the choroid in cases of detached retina. Dr. BALLANTYNE (Glasgow) proposed a vote of thanks to Sir John Parsons and to Dr. Paton for their services in the chair, seconded by Dr. BOUCHER (Vancouver).

SECTION OF PUBLIC HEALTH

Thursday, July 28th

VOCATIONAL GUIDANCE AND HEALTH OF INDUSTRIAL WORKER

Dr. A. MACRAE, who opened the discussion on the second day of this Section, called attention to the high number of industrial workers who were physical misfits, and tentatively suggested ways in which vocational guidance might be improved on its medical side. The medical examination should be devised to disclose physical capacity and to measure its degree, not only to detect physical deficiencies. Perfection of faculty should be its aim, and not merely prevention of ill. Clinical insight should achieve a reliable grading of general robustness and special physical conditions. The clinical and family histories should always be considered. At the end of his examination the physician should be able to supply positive and negative indications as regards general occupational conditions. The modern intelligence tests were very helpful in gauging the general mental ability. In quite a short interview a trained psychologist could estimate accurately the simpler temperamental tendencies, such as sociability, sympathy, cheerfulness, assertiveness, and timidity ; while the more complex qualities, including honesty, industry, and reliability, could be assessed with the aid of teachers and parents. In temperamental abnormalities a congenial occupation might have therapeutic potentialities. The mental strain resulting from uncongenial employment might, on the other hand, be a contributory cause of such

grave conditions as alcoholism and insanity. Wise vocational guidance had proved valuable in preventing the common disorders of the schizophrenic type. It followed that the special requirements of the occupation required to be taken into consideration by the medical examiner. The general practitioner had usually insufficient time to undertake vocational guidance, even if he possessed the special training and temperament necessary. Hence a team was required, the medical practitioner, psychologist, teacher, employer, parent, and child each playing his important part. Guidance for work should be supplemented by guidance for leisure, and some supervision of the juvenile worker should be maintained.

Dr. R. D. Gillespie remarked that the modern trend of psychiatry was increasingly prophylactic. He defined the common sources of problem cases encountered by the psychiatrist as: (1) children leaving school; (2) adolescents who had left school, and were constantly changing their employment; (3) the school "leaver" or adolescent with an average intellect but disproportionate ambition; (4) children with morbid unrest due to too ambitious parents; and (5) children of the professional classes with intelligence and aptitude far below the average. Vocational guidance must take into consideration the existence in a few people of neurotic symptoms which were definitely disabling for some careers, but not for others. Lack of it might lead to nervous or mental illness, occupational misfitting, and chronic invalidism. He concluded that there should be an examination of the mental equipment of every school child, not later than the age of 11, so that future vocational guidance should not be so unnecessarily handicapped as it was now. Greater attention must be paid to the temperamental aspect of personal equipment for life and work, and the help of the psychiatrist would be most valuable. Dr. May Smith of the Industrial Health Research Board emphasized the importance of emotional adjustment, and instanced the case of "telegraphist's cramp." Two separate sets of data were required in the study of the expression of maladjustment: (1) the divergence of individuals from some accepted standard of efficiency, social adaptability, and health; (2) some assessment of the type and degree of maladjustment. The speaker gave illustrations of the characteristic manifestations. There were two main groups of symptoms: (1) those appearing in a recognizable emotional form, chiefly of the nature of fear connected with some specific object or situation; and (2) those chiefly characterized by an "irrational drive." Having classified persons according to the presence or absence of symptoms, a relation could be worked out to conditions of work, satisfaction with work, and sickness. The speaker finally defined the occupational openings suited or unsuited to nervous persons. Professor C. S. Myers dealt with certain practical possibilities. Vocational guidance, he said, must have a voluntary beginning, as child guidance had had, and later be taken over by the State. The Institute of Industrial Psychology was meeting with a considerable amount of success, and the necessity for expert medical assistance was fully recognized. Psychology, he added, ought now to be more prominent in the medical curriculum, since it had become less philosophical and more scientific. Guidance officers in Germany, instructed by reports from schools, were able to send persons in need of assistance to psychologists. In Birmingham an experiment was about to be tried in which trained teachers in schools would conduct tests, the results being sent to the child guidance office for decisions to be made. There was a real danger that such tests might dominate the situation too powerfully, and have insufficient individual application. A test on 1,200 school children conducted by the Institute had led to the suggested appointment of a part-time "careers master" in schools and a whole-time regional expert. Considerable environmental knowledge was essential in studying individual cases.

The President, Sir George Newman, asked that special attention should be paid to the practical sides of the subject. He had studied the position in America, and was satisfied that at the Ministry of Health good work had been going on for some years of the "feeling the way" type. Some examination was made of most elementary school children as regards their mental capacities between the ages of 12 and 14, for the leaving child represented the fruit of education. For many years consideration had also been given to the mental normality and capacity of these children as regards industry generally, for the educational scheme of this country was directed at the rearing of a great human race. Physical and mental defects had to be corrected so as to make the child fit for work in the world, and certain steps were being taken. For example, there was the appointment in the School Medical Service of a specialist psychologist, who would draw the attention of backward local authorities to possibilities of improvement in these respects. The President thought that research institutes should be whole-time activities, but they should not be financed by the State. The medical curriculum was too overloaded for the inclusion of psychological medicine on an extended basis, even though this branch was steadily gaining ground as a practical necessity in the case of general practitioners. The general problem of adapting it to industry was immensely important, and it was unquestionable that great progress would be made in the future.

Dr. A. K. Chalmers (Vice-President of the Section) gave details of work which had been done in this field, and mentioned the difficulty of dealing with persons who had been trained for one occupation and later had to take up a different kind of work. This was an increasing problem, but regimentation must not be allowed to creep in. Dr. J. C. Bridge (Home Office) praised the practical nature of the papers which had been read. He added that work along these lines would definitely tend to reduce the number of accidents in industries. He strongly urged the necessity of examining workers after they had been in some definite line of employment. Sickness and absenteeism would be concurrently reduced as these practical proposals gained ground. Dr. Macrae, replying, stressed the importance of team work. The purely physical aspects of these examinations should receive more attention of a practical kind. School medical officers could do more by supplying definite indications and contra-indications as regards specific employment. There should be more medical supervision of the young worker in the early years of his employment, special attention being directed to the question of whether his physical condition and work were happily related.

Skin Diseases in Relation to Industry

Dr. W. J. O'Donovan opened a discussion on this subject, which appears in full in this week's issue at page 292.

Dr. H. Haldin-Davis summarized, and illustrated by lantern slides, the measures recommended by public authorities in respect of industrial diseases, and adopted and developed by manufacturers for their prevention. He paid special attention to anthrax, skin cancer, chrome ulceration, and trade dermatitis. In the last case prevention was of the first importance; this was effected by regulations as regards work conditions, cautionary notices, and constant supervision. Gloves could hardly be worn in the food trades, but elsewhere they had their uses—better recognized in the United States and Canada.

Treatment was then discussed in some detail by the speaker, who concluded by pointing out that the worker received more consideration and protection in Great Britain than in other countries. Sir Kenneth Goadby (specialist medical referee for industrial diseases) said that his outlook in the discussion was that of one charged with the duty of finding for or against the verdict of the certifying surgeon. He described the difficulties so encountered. Affections of the skin, from his point of view, fell into three categories: (1) diseases of the skin suffered by the general population, such as lichen planus, scabies, and psoriasis, which were frequently certified as "dermatitis due to dust or liquids"; (2) affections arising through some external cause—exogenous or traumatic dermatitis; and (3) the "pattern" or inborn type of skin reaction. This group gave rise to the greatest difficulty, including, as it did, the hyper-reactive patients who exhibited urticaria factitia, and the subjects of some natural allergy who had acquired it through their occupation. As regards gloves, these should be suitably devised, and were no more likely to be entangled in moving machinery than were overalls. Dr. O'Donovan, in reply, commented on certain risks associated with the use of gloves in industry.

SECTION OF PHYSICAL MEDICINE

Thursday, July 28th

The Menace of Quackery

The opening paper was read by Dr. C. B. Heald, with the President (Sir Leonard Hill) in the chair.

Dr. Heald, after defining quackery, divided quacks into two types: the charlatan and the ignoramus. The former he dismissed as being of little danger, since his results were poor. The latter he subdivided into (*a*) the unqualified practitioner, (*b*) the manufacturer of apparatus, and (*c*) the qualified quack. He considered the menace presented by these types to be in that order. Much scope was left for these persons by the loose diagnosis with which the orthodox profession was content in lesions which presented but few gross physical abnormalities. As diagnosis became accurate, he said, quackery perforce walked out of the door. Opportunities provided for instruction in physical methods were at present meagre and consequently there was inevitable agnosticism of the profession at large. He made the suggestion that the status of the physicians in charge of physio-therapeutics in hospitals should be made comparable with that of the other specialists. This could be done by centralization of all physical methods in one department. This department could be supervised by men who were candidates for the medical and surgical staff in the same way as other departments—such as cardiology or orthopaedics—often proved stepping-stones to the full staff. Good men would be assured, teaching would become routine for the students, interest in the subject would be placed in sound hands and diffused more generally throughout the profession, and beds would ultimately become available for investigation and treatment. A further suggestion was that a committee be established for investigating claims for apparatus; this would stem the flood of quack appliances.

Dr. F. D. Howitt commented on the advances made and the consolidation already achieved by physical medicine in a comparatively short time. He mentioned the formation of Sections on the subject in both the British Medical Association and the Royal Society of Medicine, and the co-ordination of all technical branches of the subject in the Chartered Society of Massage and Medical Gymnastics and in the Register of Bio-Physical Assistants. Deprecating misplaced and uncritical enthusiam, he quoted "focal sepsis" as an example of such in another branch of medicine. He instanced the vicissitudes of actinotherapy in popular esteem before its true "niche" was agreed upon, and warned the exponents of various modern treatments against the dangers of uncertain dosage and indiscriminate application. He sounded a hopeful note for the future if knowledge were centralized and diffused as the result of such discussions. Dr. C. W. Buckley (Buxton) defined the policy of physical medicine as the treatment of disease by external methods after investigating and establishing them on a scientific basis and delimiting the scope of their value. He appealed particularly for further investigation into hydrological and spa methods, and the control of advertising, both by spas and by physical treatment institutions. He wished to limit such methods of treatment to those with special training and experience. Dr. R. King Brown deprecated the unscientific methods of investigation and comparison which were often employed in this field of medicine. Dr. A. P. Cawadias spoke of religious healers and quacks. Dr. M. B. Ray proposed that the British Medical Association should take action with regard to physical methods and appliances similar to that taken by it with regard to secret drug remedies. Dr. J. B. Mennell then repeated by request his practical demonstration of spinal and joint manipulation. He appealed for loyalty to members of the C.S.M.M.G. when treatments were ordered in private practice, pointing out that these members had pledged themselves to loyalty to the medical profession. Mr. Bowdler Henry read a paper on the intra-oral application of diathermy currents.

SECTION OF PATHOLOGY

Thursday, July 28th

Cholesterol Metabolism in Disease

Professor I. Walker Hall took the chair. Mr. J. A. Gardner, M.A., F.I.C., opening a discussion on cholesterol metabolism in disease, said that cholesterol was an integral constituent of all cells and organs. It existed in the free or alcoholic condition and also as esters of the higher fatty acids. These two forms were not equally distributed. Cholesterol was an unsaturated secondary alcohol derived from cholestane. By catalytic reduction the double link was saturated with the formation of β-cholestanol, a saturated secondary alcohol. Coprosterol, which occurred in human faeces, was a stero-isomer of β-cholestanol, the difference depending on a steric rearrangement of the substituent groups at one of the carbon atoms. The parent hydrocarbon coprostane was a stero-isomer of cholestane. In herbivorous animals there was a cycle, cholesterol from broken-down cells being excreted in the bile and reabsorbed by the intestine. That this was not the whole story had been clearly shown by balance experiments in which it became certain that cholesterol was synthesized in the body of these animals. In carnivora and omnivora an excretory mechanism existed, sterol in the form of cholesterol or coprosterol being found in the faeces. In man this excretion had been shown always to be greater in quantity than the amount ingested with the food. Böhm, reporting on the content of a completely closed loop of intestine of fourteen years' standing in a human subject, found the sterol present consisted of β-cholestanol, proving that sterols may be excreted in the intestine as well as with the bile. Accumulations of cholesterol esters in organs and deposits in the aorta had been produced by feeding experiments in animals, but there was no evidence to associate atherosclerosis in man with exogenous cholesterol metabolism. The cholesterol content of "fasting" plasma varied markedly in different healthy individuals, but was fairly constant for a single individual. The ester cholesterol usually formed 60 to 70 per cent. of the total cholesterol. In pregnancy it was found that the free cholesterol of the plasma increased up to a maximum at about the thirtieth week: the ester

cholesterol fell concurrently. This process was then reversed until near parturition an almost normal ratio of free to ester cholesterol was attained and persisted for the first week or two of the puerperium. Since they knew nothing whatever of the function of cholesterol in the cells it would be idle to indulge hypothetical explanations of these facts. By whatever means bile was deviated from the intestine, whether by obstruction and stasis or obstruction and an external fistula, the percentage of cholesterol ester in the plasma fell to vanishing-point. Hypercholesterolaemia which occurred in biliary obstruction was generally believed to be due to cholesterol retention, but in bile stasis there was probably a failure of alimentary absorption which might balance the cholesterol retention. The cause of hypercholesterolaemia in nephrosis was not known. In myxoedema the total cholesterol of the plasma might be increased by nearly 50 per cent., but in Graves's disease it was within normal limits. So that the suggestion that a relation existed between the basal metabolic rate and blood cholesterol did not appear proven.

Professor Ludwig Aschoff (Freiburg) confined his remarks to the relation between cholesterol metabolism and vascular disease. The cholesterol esters predominated among the visible fatty deposits in the intima. The nutrition of the intima and inner part of the media was effected by plasma filtering through from the lumen of the vessel, and the cholesterol must be carried into the intima in this stream. There was a cementing substance welding together the elastic fibres which separated the intima from the media, and cholesterol was first deposited in this substance—it was, in fact, an infiltration. It began in infancy, passed through another phase at puberty, and reached its maximum development in the degenerative period of adult age. First seen in the mitral valve it spread, through these periods of life, to the root of the aorta and thoracic aorta, then to the abdominal aorta, and finally to the peripheral arteries. Calcification had nothing to do with this atheroma; it was secondary to necrosis in the atheromatous plaques. In adult hypercholesterolaemia there was a marked association with atheroma—for instance, in diabetes. Atheroma might also be associated with food, or more probably it represented a sort of cholesterol gout—in other words, it was a metabolic disease. In adult atheroma the precipitation of the lipoids was most marked at all the weak spots—that is, where branches were given off or at the site of the ductus arteriosus. Pure cholesterol gall-stones he believed to have a definite relation to hypercholesterolaemia, but other gall-stones had no such relation.

Dr. Schoenheimer (Freiburg) said that bile cholesterol appeared to be quantitatively reabsorbed and that part of it found in the faeces was excreted through the intestinal wall. Some of this was changed by the intestinal flora into coprosterol, which was incapable of being reabsorbed. The process was therefore one of coincident secretion of cholesterol and concentration of β-cholesterol, the latter being concentrated by the reabsorption of the former. This had been clearly demonstrated in his experiments, in which intestinal loops were separated in dogs and their content examined at various later dates. A case was described with hypercholesterolaemia of 850 mg., in contrast with the normal 150 mg., in which, when put on a vegetarian diet, the cholesterol in the blood dropped to 350 mg. This appeared to him to be the first case described of specific disturbance of cholesterol excretion.

Dr. S. C. Dyke (Wolverhampton) described the "lipoid splenomegalies." We knew of three conditions associated with congenital failure in the establishment of normal lipoid metabolism; they were Gaucher's splenomegaly, Niemann-Pick splenohepatomegaly, and the Schüller-Christian syndrome. The lipoid in Gaucher's disease was always a cerebroside, in Niemann-Pick disease the fats were phospho-lipins—mostly lecithin—while cholesterol was the lipoid found in the Schüller-Christian syndrome. Dr. J. W. McNee referred to the early investigation of the reticulo-endothelial system and cholesterol metabolism with which he was associated in Professor Aschoff's laboratory. Dr. H. Gainsborough said that we knew that cholesterol in the plasma was closely associated with the protein, particularly with the euglobulin fraction. He considered that the cholesterol content of the plasma underwent changes in the conditions producing disturbance of plasma proteins, or fat metabolism, or bile acid metabolism. He did not consider it likely that any one mechanism could be invoked to explain the occurrence of hypercholesterolaemia in different diseases. Dr. J. M. H. Campbell discussed some of the clinical aspects of cholesterol metabolism, and suggested that the cholesterol-lecithin ratio might be constant, and so of value in estimating abnormal cholesterol metabolism. Dr. Robertson (for Professor Dodds) confined his remarks to the cholesterol content of the blood and oedema. Blood cholesterol did not vary *pari passu* with the amount of oedema, and the mechanism of a cholesterol rise was not a depletion of plasma proteins. Professor M. J. Stewart (Leeds) suggested that hypercholesterolaemia might be temporary or intermittent, and that this might account for some of the anomalous clinical conditions. Dr. Cecilia Shiskin considered that all the evidence pointed to the hypercholesterolaemia of pregnancy being physiological. Dr. W. Kay (Manchester) had found a reciprocal relation between cholesterol and the fatty acid contents of adrenals. Dr. Dam (Copenhagen) discussed the origin of coprosterol in the intestine, and stated that the newer work showed that it could be formed by putrefaction *in vitro*.

SECTION OF BACTERIOLOGY

Thursday, July 28th

Milk-borne Infections

With Professor J. M. Beattie in the chair, Captain S. R. Douglas opened the discussion on the bacteriological aspects of milk-borne infections with the paper published in our issue of July 30th. He gave a general review of milk-borne diseases, particularly tuberculosis, undulant fever, and streptococcal infections.

Dr. Otto Moltke described the methods which have been adopted in Denmark for the control of typhoid and paratyphoid carriers. Such individuals were advised of their danger to the community and were instructed to report their movements to the public health authorities. They were forbidden to engage in dairy work. These precautions had resulted in a great decrease in milk epidemics of typhoid and paratyphoid fevers. He also described experiments which had been made for the comparison of the quality of milk obtained by milking machines with that of ordinary milking. Although milking machines gave satisfactory results when in good condition, the danger was that a mechanical defect or a fault in cleaning resulted in a very heavy pollution of the milk. Speaking of the inhibitory effect on bacterial growth of raw milk, he pointed out that this property was lost by heating. When milk-borne epidemics had occurred in Denmark they had been thoroughly investigated by the public health authorities and the facts fully published. Dr. F. C. Minett took up the question of streptococcal diseases conveyed by milk. Streptococcal mastitis was very common amongst milch cows, but the varieties of streptococci ordinarily encountered in mastitis were non-pathogenic for human beings, and could be distinguished bacteriologically from streptococci associated with disease in man. In certain cases haemolytic streptococci had been cultivated from the milk of cows in herds associated with

epidemics, and these bacteria had been shown to be indistinguishable from the streptococci isolated from human patients in the same epidemics. As a rule not more than one or two cows in the incriminated herd were found to be infected with these streptococci. Cows which excreted such microbes either suffered from a clinically recognizable mastitis or they might exhibit an enduring latent infection in which clinical signs were not obvious. Following an initial and perhaps a severe attack of mastitis in one quarter of the udder, the infection might spread to other quarters, in which the disease might appear to be comparatively mild. Some strains of haemolytic streptococci from man were capable of infecting the cow's udder experimentally. Haemolytic streptococci from man added to milk kept at 20° C. for forty-eight hours increased in numbers only slightly, whereas the common saprophytic bacteria of milk multiplied greatly under these conditions. He estimated that about 20 per cent. of mastitis in cows might be due to streptococci of human origin. Sir WELDON DALRYMPLE-CHAMPNEYS gave the records of eighty-three cases of undulant fever which have occurred in England and Wales. Practical proof that cow's milk was the source of these infections was based on demonstrations of agglutinins in the blood or milk of the cows supplying milk to the patient. A titre of 1 in 50 with the blood serum of a cow might probably be accepted as evidence of infection, but for milk whey quite a low agglutinating titre (1 in 20) was usually regarded as sufficient, as in practice the titre for the whey was found to correspond to a titre about five times as great in the blood stream. Contagious abortion was very common among cattle in this country, and probably at least half our herds contained infected cows. There appeared to be no satisfactory safeguard against infection with undulant fever at present except universal pasteurization of milk. Colonel E. C. G. MADDOCK described experiments which proved that tubercle bacilli could survive and retain their virulence in soil for as long as six months and on grass for more than sixty days. Dr. STANLEY GRIFFITH drew attention once more to the danger of tuberculosis from cow's milk. As a means of prevention he did not consider the routine testing of milk samples by animal inoculation to be of much value, and recommended its replacement by veterinary inspection and the routine testing of milch cows with tuberculin. No milk from reacting cows should be allowed to be sold for consumption in the raw state, or for making butter unless pasteurized. Dr. C. P. BEATTIE reported investigations in Edinburgh which showed that of retailed raw milk samples about one-sixth contained tubercle bacilli, whilst over one-third contained *Bacillus abortus*. One-ninth of the farm milk samples contained the tubercle bacillus, and one-sixth the *Bacillus abortus*. Pasteurization by the "holder" method, when efficiently carried out, was shown to kill both microbes. Eleven cases of undulant fever had been discovered in Edinburgh and district since September, 1930. In ten no other source of infection could be found than the milk supply.

Dr. H. T. R. MATTICK pointed out that the changes which took place in milk when pasteurized were not yet fully known. There was need for a thorough and accurate investigation of the nutritional value of pasteurized compared with raw milk. It was known, for instance, that the inhibitory effect on pathogenic bacteria excreted by raw milk was lost after pasteurization. This might possibly be due to the destruction of agglutinins which occurred at 56° C., or to interference with phagocytosis, or bacteriolysins or lysozyme. Dr. A. JOE discussed milk-borne epidemics of scarlet fever. Professor BIGGER maintained that clean milk was to be preferred to pasteurized milk, especially in view of the unsatisfactory methods of pasteurization which were practised in some parts of Great Britain and Ireland. Mr. TUSTING of the United Dairies warned the section of the dangers of tuberculosis from milk sold as certified or tuberculin-tested, and reaffirmed his belief in pasteurization as a protection against tuberculosis and undulant fever. The CHAIRMAN closed the discussion by emphasizing the importance of controls in all scientific work in milk-borne diseases.

SECTION OF DISEASES OF CHILDREN

Thursday, July 28th

BRONCHIECTASIS

With the President, Dr. G. F. STILL, in the chair, a discussion was held on bronchiectasis. The opening paper by Professor C. MCNEIL (Edinburgh) appeared in full in the issue of August 6th (p. 229).

Dr. HUGH THURSFIELD, continuing the discussion, said that he thought medicine had become obsessed with Laennec's original discoveries, and it would be better to discard the term "bronchiectasis," and regard dilatation of the bronchi not as a clinical entity, but as an inevitable accompaniment of any prolonged inflammation of the lung tissue. The condition of bronchiectasis was the terminal stage of a common condition, and in the early stages neither physical examination nor lipiodol would show bronchial dilatation, which was, however, almost certainly present. He preferred to call such cases "fibrosis of the lung." Many patients recovered completely, even when clinical evidence of dilated bronchi was present. In conclusion, Dr. Thursfield said he thought bronchoscopy would be the most hopeful line of treatment in the future. Dr. STANLEY GRAHAM (Glasgow) agreed that the pulmonary lesions associated with the infectious diseases measles and whooping-cough seemed to play a peculiarly significant part in the etiology of bronchiectasis. He thought that although suppurative bronchitis was an early part of the pathological process leading to destruction of the walls of the bronchi, the importance of contraction of fibrous tissue in the lungs must not be forgotten in relation to the dilatation of the bronchial tubes which occurred. Prognosis, he thought, still remained a vexed question, and since lipiodol represented a satisfactory method of estimating the extent of the mischief in the lungs it ought to be possible, to settle this matter in the future. Mr. J. E. H. ROBERTS, in dealing with some aspects of the treatment of bronchiectasis, urged that the term was ill-defined, and in any case dilated bronchial tubes alone were of no consequence and caused no trouble. It was infection of these dilated areas that mattered. The aim of treatment, he said, was to get rid of infected material and keep the bronchial dilatations as dry as possible. He believed bronchoscopy of more value for the getting rid of strictures of the bronchial tree and aspirating infected material than for bronchial lavage. In some cases the cavitation of the lung could be dealt with by collapse by means of an artificial pneumothorax. In affections of the lower lobe, where adhesions prevented collapse from occurring under this treatment, division of the phrenic nerve might help. The more serious operation of thoracoplasty might be attempted, but there was no means of being certain whether the case would benefit from this or not. More recently, said Mr. Roberts, a new method of lobectomy had been introduced, with a very low mortality, and he believed this opened up great possibilities in the treatment of bronchiectasis. Dr. H. TUKE ASHBY (Manchester) said that he thought bronchiectasis started much earlier than was generally believed, and he described a case in a baby of 8 months. With regard to prognosis he thought patients either died early in the course of the disease or else survived the initial phases and did reasonably well. Dr. N. B. CAPON (Liverpool) also urged that Laennec should be forgotten, since dilatation of the bronchi was

only the terminal phase of the chronic infection of the lungs. He suggested that its comparative rarity in private practice indicated that diet, climate, etc., made all the difference when the proper recovery of the child from some acute diseases of the lungs was considered, and he thought re-expansion of the lungs after any type of chest lesion was of great importance. Dr. P. F. Armand-Delille (Paris) dealt with the relation between tuberculosis and bronchiectasis. He showed how some cases with tuberculous fibrosis might develop bronchiectasis in the affected areas and, conversely, how cases with congenital bronchiectasis of the type described as congenital cystic disease of the lung might develop a tuberculous infection in the diseased areas. Dr. C. P. Lapage (Manchester) thought bronchopneumonia a much more common cause than measles or whooping-cough, in his experience of some forty cases. The age of onset was usually below 4, but not many cases seemed to follow atelectasis at birth. Treatment must be directed towards producing fibrosis and even calcification, and he had obtained good results, especially when attention was directed to the prevention of recurrent infections. Dr. Ernest Fletcher spoke of congenital bronchiectasis, describing the three conditions with which it was associated: maldevelopment of the lung, residual areas of atelectasis, and the presence of an accessory lobe.

Minerals and Vitamins

Dr. Alan Brown (Toronto) read a paper on the role of minerals and vitamins in growth and resistance to infection. He dealt especially with the provision of adequate amounts of calcium, iron, and iodine in the diet, which could not be left to chance, since average diets often showed a grave deficiency in these substances. With regard to vitamins he described a form of bread now available in Canada containing vitamin D, and a special cereal which contained an adequate supply of the vitamins and minerals necessary for optimum health.

Osteomyelitis

Mr. C. P. G. Wakeley reviewed the subject of acute osteomyelitis in children, stressing the fact that the disease was not so frequent as it was thirty years ago. He discussed the aetiology, mentioning that trauma probably played no part. Every case, he thought, required immediate drainage, but it was not necessary to open the medullary cavity in every case as a routine.

SECTION OF TUBERCULOSIS

Wednesday, July 27th

Tuberculin in Treatment

Owing to an unfortunate mistake in the reporting of the first day's proceedings of the Section of Tuberculosis (*British Medical Journal*, August 6th, p. 261) no mention was made of Dr. R. A. Young's opening paper on the position to-day of tuberculin in treatment.

Dr. Young said that the introduction of tuberculin had been one of the great tragedies of medical research. Referring especially to its use in treatment he remarked that the routine employment of tuberculin had been restricted in many sanatoriums. It was evident that the effects of tuberculin had been disappointing in the strictly medical cases, notably in pulmonary tuberculosis. That so many attempts had been made to modify tuberculin for medical, as opposed to surgical, use in treatment suggested that it had been found wanting in some respects. His own experience had led the speaker to believe that tuberculin had definite therapeutic uses, which were considerable in the localized or surgical manifestations and strictly limited in the pulmonary forms of the disease. In cases of pulmonary tuberculosis, tuberculin was useful only in those patients in whom the disease had progressed satisfactorily towards arrest, but who were left with a small expectoration containing tubercle bacilli. It was contraindicated if there was active, spreading, caseous disease, or if there was any degree of continuous, remittent, or intermittent fever. Dr. Young then discussed the best forms in which to employ tuberculin, its dosage, and method of administration. At the end of the discussion Dr. Young summed up the points which had been raised.

Thursday, July 28th

Bovine Bacillus in Human Tuberculosis

Sir Robert Philip, President of the Section, took the chair and briefly introduced the subject of the meeting, "The role of the bovine tubercle bacillus in human tuberculosis," with a review of historical developments.

Dr. Stanley Griffith (Cambridge) and Professor Bruno Lange (Berlin) opened the discussion with papers which will be printed in full later.

Dr. W. T. Munro (Glenlomond) gave the figures for the bovine type of tubercle bacillus found in cases of pulmonary tuberculosis. Out of 500 cases 20 per cent. had been found of bovine origin. In fifty cases of bone and joint tuberculosis 26 per cent. were attributable to the bovine type, and in cervical glandular lesions, 33 per cent. The bovine bacillus could produce exactly the same kind of lesions as the human type, and it was a dangerous idea to consider that it was less virulent. In some cases of bovine pulmonary infection the disease became rapidly generalized and produced multiple lesions. Other strains seemed to cause great proliferation of tissue—itself a cause of symptoms. Koch was mistaken in his view that the bovine tubercle bacillus was not dangerous to the human subject. It was a serious menace to humanity, and those who advocated a small dose of bovine bacilli as a preventive against more serious tuberculosis incurred a very grave responsibility. Professor John Fraser (Edinburgh) said that tuberculous disease of the glands, bones, and joints was much less frequent to-day than it was twenty-five years ago, but it was still deplorably common. It was estimated that three million cows and heifers in England were tuberculous. In Edinburgh, in five years (1920–4), 44 per cent. of the cattle passing through the city abattoirs were tuberculous, and, although less than 1 per cent. suffered from actual tuberculosis of the udder, there seemed no reason why the cow suffering from generalized tuberculosis should not give tuberculous milk. Damage was caused often to the town-bred family through residence on a farm in the country, where unsuspected bovine tuberculosis existed. An old Scottish remedy for this disease included the drinking of goat's milk. It might be that this had some therapeutic and epidemiological value. Dr. W. G. Savage (Somerset) reviewed the administrative problem in preventing infection with the bovine tubercle bacillus. There were two methods of eliminating infected cows: (1) to attack those who gave a positive tuberculin reaction, and (2) to eliminate only the open cases. The latter method he condemned as impracticable, and the former was carried out in Britain only on a small scale. In England there were four direct administrative procedures in view: (1) the Tuberculosis Order (1925) aiming at the destruction of cows suffering from notifiable tuberculosis; (2) regular veterinary inspection—practised to a small extent in England, but compulsory in Scotland; (3) a system of graded milk under special designations; and (4) treatment by pasteurization. The last was the method which Dr. Savage favoured. Effectively controlled pasteurization was the only solution to the problem of

bovine tuberculosis, and also that of eliminating other infections carried through milk. Dr. W. M. Cumming (Grassington) described his work with 352 cases of pulmonary tuberculosis, in which the bovine type of tubercle bacillus was isolated in fourteen cases. In all cases at post mortem the primary infection was found to be alimentary. Clinically speaking these bovine pulmonary cases fell into two groups. Nine were of the super-infection type with a bad prognosis. The other five showed a spreading from the root of the lung with a frequently negative sputum and a better prognosis. In his bovine cases he had found that milk was not always drunk. Intermittent infection might play a part. He agreed with other speakers about the seriousness of bovine infection and its unfavourable prognostic significance. Open bovine pulmonary cases were important from the preventive point of view.

Dr. C. H. Vrooman (Vancouver, B.C.) described the methods of eliminating bovine tuberculosis in herds in the dairy area supplying Vancouver. All reacting cows were killed. After three tests the number of reactors fell to 2 per cent., and at the last estimation to 0.5 per cent. of positive cases. No cows could be brought into the area unless negative to the test. All milk sold in Vancouver was now either from a certified herd or was pasteurized. Cases of tuberculous adenitis had very remarkably diminished in the last twenty-five years. Dr. A. S. M. Macgregor (Glasgow) gave his experience of the problem of preventing bovine infection in the milk supply of a large city which was positive in over 10 per cent. of samples, although herds were inspected in the surrounding counties from whence the milk came. He favoured compulsory pasteurization of all milk that was not produced from tuberculin-tested cows. The city of Glasgow would shortly ask for powers in the matter.

Dr. Stanley Griffith, in reply to the discussion, concurred with the findings of Munro and Cumming. He believed that the reason why the bovine bacillus has failed to become established as a common cause of tuberculosis was that it was so highly virulent as to cause acute fatal tuberculosis. The bovine bacillus was probably a little more virulent than the human type for man. Small doses of bovine infection were responsible for many of the localized forms of the disease. Sir StClair Thomson read a paper on " Tuberculosis of the larynx and artificial sunlight treatment." There was no striking evidence of benefit from this form of treatment. Equally good results had been obtained with voice rest and artificial pneumothorax combined with a sanatorium regime.

SECTION OF MENTAL DISORDER

Thursday, July 28th

Education and Mental Health

Sir Maurice Craig, presiding at the discussion on mental health in relation to education, emphasized the urgent necessity for the right handling of nervous disorders in school days as the best kind of preventive medicine.

Dr. H. Crichton-Miller opened the discussion with the paper printed in last week's *Journal* at page 234.

Dr. Reginald Miller spoke of the relation of the physical health of the child to his mental health. Fatigue was perhaps the most important single factor to be considered and watched. The compulsory attendance of children at elementary schools was at times necessarily harmful in this respect, but the question of fatigue could and should be dealt with in private and public schools. While it was hard to fatigue unduly a normal child, the reverse was true of the nervous child, who, being tired, became restless and difficult in a variety of ways. The day school, which demanded the leading of " a double life," provided more strain for a child than life in a boarding school. More rest and less work were needed, and the question of feeding still had to be watched. The speaker assured his audience that " more scholarships were won on beef than on buns." Dr. Ralph H. Crowley, speaking as the senior medical officer of the Board of Education, demonstrated the increasing interest of the official school medical service in the individual child. Necessarily the interests of the education authorities had centred in the past around groups of children and around definite sickness. Maladjustment was now being recognized as at least as important in its effect on the school child. The need of the present day was a psychological service within the school system, facilities for child guidance clinics, and the education of school medical officers in psychiatric work. Conditions which led to the reformatory, prison, and the mental hospital developed under their eyes in the schools.

The Lord Bishop of Chichester spoke from the standpoint of one who was interested in the widest aspects of mental health. The strains of modern life had much to do with the increase of sickness and invalidism in the community. Fear and emotional stresses of many kinds had increased. The place of religion—not theology—was of paramount importance in work for mental health, since a dynamic religious philosophy made for purpose and sanity. There was a great need for co-operation between the ministers of religion and the medical profession in dealing with problems of delinquency and abnormality. Mr. Cuthbert Blakiston (Headmaster of Lancing College) said that there was a real need for special training in dealing with problems of mental ill-health, as well as for experience. A modern outlook on these matters was as essential for doctors as for educationists. There were striking differences in the outlook of young people of both sexes to-day from that of before the war. The spirit of adventure had in many cases been replaced by fear and boredom. The abnormalities of school children demanded psychological insight and sometimes psychotherapeutic treatment. Dr. Eva M. Clements (High Wycombe) expressed the belief that the difficult child was being very adequately dealt with in schools at present. She emphasized the need for more satisfactory sex instruction. Dr. S. Barton Hall (Liverpool) said that the opener's remark that lessons and examinations were not the only aspect of intellectual adjustment that the child should achieve at school struck at the root of the problem of mental health in relation to education. The minor maladjustments of personality were of the greatest importance ; the supernormal child demanded their interest and understanding. Dr. Morris J. Cohen (Johannesburg) spoke of work done on the correlation of examinations with schizophrenic conditions. Much mental ill-health could be prevented if parents and teachers were alive to the danger of educational pressure. Dr. William Brown (Oxford) urged that a distinction should always be made between psychopathic children and relatively normal children, who far outnumbered them. The increasing psychological knowledge of teachers would go far towards solving the problems of the difficult child. Dr. Margaret Lowenfeld reminded the meeting that conflict in the child's mind was perhaps the commonest cause for maladaptation. Dr. Sybil Yates discussed the problem of the youngest child and the delicate child. Dr. Evelyn Lucas pointed out that many of the difficulties of the child, such as its craze for speed, were the result of its attempts at adaptation to modern life. Dr. L. A. Weatherly (Bournemouth) gave his approval to the demand which had been made for treating the emotional disturbances of childhood. Dr. Crichton-Miller summed up the discussion.

SECTION OF PHYSIOLOGY AND BIOCHEMISTRY

Wednesday, July 27th

Physiology and Medicine

Following Sir Henry Dale's Presidential Address and Sir Thomas Lewis's paper on the relation between physiology and medicine, both of which papers will be published in a subsequent issue of the *Journal*, Dr. C. G. Douglas (Oxford) spoke of his attempts to bring physiology into closer co-operation with medicine. He emphasized the intimate linkage of all organs in preserving the integrity of the whole body. To aid the body to compensate itself in disease and to identify the early departure from the normal, a knowledge of the normal and its variations was essential. Students would be more interested if textbooks of physiology attempted to give a clearer picture of the body as a whole instead of giving so much attention to a mass of details. He found that more practical work on the human body enabled the student to develop observation and critical judgement, besides arousing the spirit of inquiry which was necessary for the future of research in clinical medicine.

Dr. J. A. Ryle regretted that normal and deranged function should be considered in separate compartments. What they knew as symptoms of disease were really physiological responses, either exaggerated or depressed. All great advances were the result of a combination of observation and derangement. He considered that some of the younger physiologists were occupied in a sterile type of research because of lack of contact with the realities of human biology. Dr. Ryle instanced the special study of symptoms such as pain, and the study of physiological variations in healthy subjects as fields in which physiology could bring great help to medicine. Speaking as a teacher, he advocated more classes in applied human physiology in order to develop to a greater extent the power of observation which was so necessary at the bedside.

Dr. F. R. Winton (Cambridge) discussed the overloading of the medical curriculum with descriptive matter. He was in favour of a distinction between technical and scientific instruction. Medical schools might provide a technical training for the weaker student who was unable to assimilate a scientific training. The majority, however, would benefit by a scientific course made possible by reduction to an essential minimum of technical matter. The general qualifying examination should be scaled down to this agreed level. The same distinction between the technical and scientific could be applied to the teaching of physiology itself, and also to research. Applied physiological research should be combined with clinical research in hospital organizations.

Professor Volhard (Frankfurt) spoke of the different aims of the physiologist and the physician. As an analogy he referred to the distance between the physiology and the pathology of the kidneys. The former could, as yet, give no answer to the latter on the important question of high blood pressure. Professor Volhard gave his views on the effect of atrophy of the cells lining the tubules on renal efficiency.

Sir Charles Sherrington was of the opinion that the practical physiology class was of great value in teaching observation. He spoke especially of Dr. Douglas's practical classes on the human subject. These were far superior to lectures in arousing interest. The art in research was to ask the right question ; we must equip the student with the technique necessary to answer the question when asked.

Dr. E. P. Poulton said he was in sympathy with Sir Thomas Lewis's suggestion of whole-time research workers in medicine, but he thought they should not be too numerous. Research fellowships should be graded so as to allow those who began a scientific career but who proved unsuitable for it to pass by degrees into the practice of medicine. Professor H. E. Roaf (Liverpool) spoke as a teacher of physiology. He said that the period of eighteen months given to the training in physiology had to combine the cultural and technical aspects of physiology. He considered that human practical work should come early in the course. Physiology was concerned with the correlation of function of the body as a whole. The various specialized branches of physiology, therefore, had to be linked together. Professor Samson Wright spoke of the selection of facts which were to be taught to the medical student. He considered that occasional demonstrations of patients during physiology lectures roused their interest. Professor Wilson considered that the teaching of physiology should be continued during the students' fourth and fifth years. Dr. Harrison pointed out the danger of doing too much for the student so that he did not do enough for himself. Dr. G. W. Pickering discussed the great difficulty of finding a direct application of physiological knowledge to clinical medicine.

SECTION OF ANAESTHETICS

Thursday, July 28th

Care of the Lungs in Anaesthesia

At the second session of the Section Dr. Wesley Bourne (Montreal), Vice-President, occupied the chair. Dr. H. W. Featherstone (Birmingham), opening a discussion on the care of the lungs in anaesthesia, said that ether vapour possessed an irritant action upon the respiratory mucous membrane, but he believed that this effect could be minimized by careful administration and by previously warming the vapour. It was possible that chloroform predisposed to post-operative pneumonia on account of vasomotor disturbances in lung tissue. Nitrous oxide and ethylene were comparatively inert in this respect. In his experience spinal analgesia by no means protected the patient from post-operative lung sequelae. Dr. Featherstone considered that malnutrition, purgation, and operative shock were potent causes of lung disease. Anoxaemia should be studiously avoided and additional oxygen should be given to those in whom the respiratory exchange was embarrassed. Massive collapse of the lungs was of great importance to the anaesthetist, and all possible precautions should be taken to avoid this condition, while inhalation of carbon dioxide should be used in treatment. Aspiration of infected material from the mouth, nose, and pharynx, and the existence of small epidemics of coryza were important factors in the production of post-operative lung infections. Pulmonary embolism still remained unexplained, but the fact that this condition occurred after spinal anaesthesia indicated that inhalation anaesthesia was not solely responsible.

Sir Charlton Briscoe stated that lung complications were the most important of post-operative sequelae. In his opinion the supine position was largely responsible for these troubles. The vital capacity was decreased ; the lower lobes were deflated and the upper lobes over-expanded. The reduction in vital capacity was due to the deflection of the diaphragm in the cephalic direction. Deep breathing expanded the lower lobes temporarily, but renewed quiescence was followed by deflation. Therefore, after an incision of the abdominal wall, particularly in the upper part, deflation was liable to occur. The condition was difficult to detect clinically. Secretion occurred in the unexpanded portions of the lung ; this could not be expectorated, and infection usually supervened. Forced inspiration tended to produce inhalation of infective material, and should be avoided both during anaesthesia and subsequently. Sir Charlton recognized two different conditions—namely, post-operative deflation and post-operative collapse attack. Regarding prophy-

laxis, it was important not to operate if an acute infection was commencing, or if any member of the team was suffering from coryza.

Dr. GEOFFREY MARSHALL stated that improved technique in anaesthesia could do little to prevent infection reaching the lungs by the blood stream, and still less diminish the number of cases of infarction and pulmonary embolism. The preparation of the patient was of primary importance, and he stressed the advisability of pre-operative dental treatment. Regarding anaesthetic agents, chloroform had the disadvantage of high toxicity, while ether was an irritant. The drop-bottle should be discarded and replaced by warm ether vapour. Nitrous oxide and ethylene would be used more extensively if surgeons did not complain of the poor muscular relaxation. This disability could be overcome by the additional use of a local anaesthetic. Posture during operation was important, and Dr. Marshall stated that he had seen several cases of lung abscess following dental extraction while the patient was sitting in a dental chair. Mr. DAVID BOND (Edinburgh) said that, in association with Dr. Hall, he had observed a series of twenty-three cases of post-operative massive collapse of the lung. Eleven of these cases (47.8 per cent.) had made a perfect recovery, and there was a total case mortality of 21.7 per cent. with an immediate mortality of 8.7 per cent. Chronic pulmonary lesions developed in 30.4 per cent. of the cases, and these required subsequent treatment. He considered that preventive measures required most careful attention, and he advocated the use of carbon dioxide inhalation both for this purpose and for treatment. Dr. SIMSON HALL (Edinburgh) spoke of the remote results of post-operative lung complications as encountered in a bronchoscopic clinic. He quoted statistics showing that chronic pulmonary suppuration was frequently a sequel to massive collapse of the lung. The connexion between pneumonia and collapse of the lung was emphasized, and he advocated the use of endotracheal administration and aspiration of the lung at the end of operation. Dr. C. LANGTON HEWER said that in his opinion there seemed little difference in the incidence of pulmonary complications after long operations on the upper abdomen whatever type of anaesthesia was employed. He had tried high spinal block, posterior splanchnic and field blocks, and endotracheal gas-oxygen-ether for these operations, and there was no appreciable difference in results over a fairly long series. The greatest advance made in recent years for avoiding pulmonary complications was undoubtedly the administration of CO_2-oxygen or CO_2-air mixtures after operation, whatever type of anaesthesia or analgesia had been employed. Dr. Hewer believed that it was of the greatest importance to see that the lungs were fully expanded and aerated at regular intervals after operation. The PRESIDENT considered that the extended use of local anaesthesia, as exemplified by Professor Finsterer's paper on the previous day, would contribute to the reduction of post-operative lung complications. Dr. BLOMFIELD (London) pointed out the discrepancy of opinion with regard to an important question of treatment. He inquired whether patients suffering from pulmonary collapse should be treated with carbon dioxide inhalations or not. Sir Charlton Briscoe refused this method of treatment because of the risk of inspiration of septic material. Dr. M. HUDSON considered that, in intratracheal anaesthesia, the patient could provide an adequate amount of carbon dioxide by rebreathing, which, together with stimulation due to ether, provided a perfect control of the depth of respiration. Dr. A. J. MACKENZIE (Toronto) stressed the importance of avoiding undue exposure of the patient before, during, and after operation. He considered this was an important prophylactic measure. Dr. FEATHERSTONE replied briefly to the points raised in the discussion.

EFFECTS OF ANAESTHETICS ON THE LIVER

Dr. WESLEY BOURNE read a paper on this subject. He had investigated the effect of various anaesthetics on the liver by liver-function tests, and had found that half an hour's administration of chloroform caused injury which required eight days for recovery. Ether produced a definite but transitory effect, whilst nitrous oxide and ethylene were inert in this respect unless there was concomitant anoxaemia. Amytal had very little effect, and avertin sometimes produced mild parenchymatous degeneration, with occasionally fatty changes.

Dr. A. BLOMFIELD (London) asked if Dr. Bourne connected post-anaesthetic vomiting with defects of liver function. Professor FINSTERER (Vienna) considered that intestinal atony was probably responsible for post-anaesthetic vomiting. Dr. J. GHOSH (Salford) inquired if there was less liver damage when oxygen was administered in conjunction with chloroform than when chloroform was administered alone. Dr. M. HUDSON (London) asked if the glycogenic content of the liver bore any relation to liver damage. He advocated the routine pre-operative administration of glucose. Dr. HOWARD JONES (London) stated that in certain quarters it was believed that anoxaemia was harmless in nitrous oxide anaesthesia. He had practised this in several cases with success, and with no subsequent ill effects. Dr. Z. MENNELL paid a tribute to Dr. Bourne's work. He would like to know what effects trauma, independent of anaesthesia, produced upon metabolism, and also he would like to know the cumulative effect of repeated doses of anaesthetics over short periods. Dr. GEOFFREY MARSHALL confessed a preference for basal anaesthesia. So far as shock was concerned, nitrous oxide was preferable to ether, and he considered it unwise for the patient to be cyanosed during nitrous oxide anaesthesia. Dr. F. B. PARSONS (Cambridge) asked if Dr. Bourne considered that avertin would, infrequently, produce a condition akin to delayed chloroform poisoning. The PRESIDENT stated that he had administered avertin in 794 cases. He had employed it on many occasions for cholecystectomy with no ill effect. Repeated doses of avertin had been given in tetanus with no ill effect, but he advised the preliminary administration of glucose in all cases. Dr. G. W. B. FEATHERSTONE asked if post-operative restlessness, frequently seen after basal narcosis, bore any relation to the subject under discussion.

Dr. WESLEY BOURNE replied briefly to the points raised.

SECTION OF OTO-LARYNGOLOGY

Thursday, July 28th

INTRATHORACIC NEW GROWTHS AND BRONCHOSCOPY

Dr. M. DAVIDSON, opening the discussion, said that almost every type of benign tumour occurred in the thoracic cavity from time to time, but it was the malignant growth which was mainly under discussion at present. There had been a remarkable increase in the incidence of this condition during the last fifteen years, and this was proved not only by clinical diagnosis but by post-mortem examination. The sarcomata were comparatively rare, the majority of new growths being carcinomata. In most of these the site of origin was in the bronchial mucous membrane. The following symptoms were included amongst the first signs of the presence of the growth: (1) haemoptysis, (2) pleural effusion, (3) signs of infection in the thorax, (4) unexplained bronchitis, and (5) pressure due to a massive growth. The physical signs varied, and might be due to the actual mass of the tumour or to atelectasis following obstruction of one of the larger bronchi. Radiological examination was of the utmost importance and revealed the presence

of the growth as a dense shadow with a neighbouring or surrounding shadow due to atelectasis. The effect of lipiodol was very marked, as it at once revealed the site of obstruction in the bronchus and thus in many cases of the position of the growth. Bronchoscopy was of the greatest value in cases of haemoptysis where *x* rays did not reveal any tumour. It was of value also in that a portion of a tumour might be removed for microscopical examination. The use of bronchoscopy was restricted to those cases in which the bronchial tree was affected, the purely parenchymal tumours not giving any bronchoscopic appearances. It was possible to introduce radium or radon seeds into a growth by the bronchoscope, and some excellent results had been obtained, but, so far, most cases had not been successful. Parenchymal growths could only be approached through the chest wall.

Dr. Stanley Melville said that bronchoscopy should always be done by a laryngologist, and that if it were done earlier it would often save a considerable amount of radiological and clinical investigation. The increase of carcinoma was very markedly shown in the post-mortem work at the Brompton Hospital. Radiology with the use of lipiodol was a very useful means of diagnosis. Mr. V. E. Negus said that the symptoms of malignant growth in the lung were those of mechanical obstruction with inflammatory processes below the obstruction and were very difficult to distinguish from other similar inflammatory processes, especially where there was blockage from foreign bodies and other causes. In such cases bronchoscopy was invaluable. The presence of a lung abscess in association with a carcinoma caused great difficulty in diagnosis. He had never seen any patient made worse by bronchoscopy—even in two cases of phthisis—though he believed active tuberculosis was a contraindication. He had never met any cases of cocaine poisoning. Mr. E. D. D. Davis said that one or more of the following symptoms were present in the cases referred to him—hoarseness, haemoptysis, severe and persistent cough, dyspnoea, and dysphagia. He found that secondary glands in the mediastinum caused a widening and flattening of the carina, and that there was a tapering constriction of the bronchus. Pain in the chest without acute inflammatory disease was usually due to malignant disease, but stridor was rare. Dr. Ewart Martin (Edinburgh) said that team work was absolutely necessary and that every member of the team should be highly trained. In some cases the diagnosis by radiography was so obvious that bronchoscopy was not necessary, but in others it was only established by removal of a portion for biopsy. He pointed out that benign growths might cause death from the effects of obstruction. Clinically there were no characteristic signs of a new growth. Mr. H. P. Nelson said that the radiographic shadow was an indication rather of the degree of obstruction than the size of the growth. Bronchoscopy only showed the upper edge of a growth. Rigidity of the walls and widening of the carina were important signs. Growths of the upper lobe bronchus were difficult to see by its means. Mr. Nelson described the various forms of treatment, including his own method of inserting radon seeds into the tracheal and mediastinal glands. The President (Sir StClair Thomson) said that every bronchoscopist should be a laryngologist, but that every laryngologist could not expect to be a bronchoscopist. It was only in decided and prolonged haemoptysis that the bronchoscope should invariably be used. The physician should always be the final court of appeal.

Dr. Graham Hodgson then read a paper on the radiographic demonstration of sinusitis. He emphasized the need for the most accurate and consistent centring and angulation. Radiograms taken with the patient in the recumbent position could never show a fluid level, but in the erect posture it was very easily demonstrated in almost every sinus and could be confirmed by tilting the head. Six views were always taken and these clearly showed every sinus. Dr. R. Graham Brown (Melbourne) agreed with the necessity for the standard position, but thought that the condition of the membrane was more important than the presence of fluid. He had not found lipiodol satisfactory but used "abrodil," a watery solution which stained the mucosa and was radiologically opaque.

SECTION OF FORENSIC MEDICINE

Thursday, July 28th

Presidential Address

Sir William Willcox, President of the Section, opened the proceedings with a survey of the advance in forensic medicine during the last hundred years. Discoveries in chemistry, physics, and physical chemistry, he said, had been consistently applied to the solution of medico-legal problems. In 1839, three years after Marsh had elaborated his test, Orfila laid the foundation of toxicological analysis by showing that in fatal cases of arsenical poisoning the element could be detected in all organs of the body. It became evident, in relation not only to arsenic but to all poisons, that it was the absorbed material that caused death, the poison in the stomach and intestines being outside the body and only potential for harm. Toxicological diagnosis now moved forward swiftly. In 1844 Fresinius and Von Babo devised a way of detecting mineral poisons in the viscera, and a few years later Stas extracted alkaloidal poisons from the body by a method which, in a modified form, was still in general use. Turning to the contribution of biological studies, the President cited, as a familiar example, the precise knowledge that could now be elicited from the analysis of even minute blood stains. The expert could specify the animal from which the blood was derived, and, in the human subject, the blood group to which the stain belonged. A further interesting advance was in the study of firearm injuries. By microscopical and microchemical examination of the projectile the weapon from which it had been fired could be identified, and this technique had been applied in the investigation of several cases of murder. After passing in review some famous criminal trials which served to illustrate how the advance of science had forwarded the ends of justice, Sir William made a plea for a more generous public recognition and support of forensic medicine. He hoped the University of London would follow the example of Edinburgh by establishing a professorial chair in this subject, and that steps would be taken to found a medico-legal institute which would act as a centre for research and post-graduate training.

Arsenic in Keratin Tissues

Professor Sydney Smith (Edinburgh) described a series of investigations aimed at discovering whether the presence of arsenic in the hair, nails, and skin, after all traces of it had disappeared from other organs, indicated preferential absorption by the keratin tissues, or merely a trapping of this element in non-vascular tissues. The investigations aimed further at ascertaining: (1) whether, supposing such preferential absorption existed, it was a function of living pre-keratin tissues, or whether keratin itself absorbed arsenic preferentially *in vitro*; (2) whether it was due to chemical action between arsenic and certain products of cellular activity or was a simple absorption; (3) whether arsenic absorbed into the growing point of hair passed along the fibre or remained fixed; (4) whether, having accumulated in keratin tissues, it could be re-absorbed into the blood stream; (5) whether, from the

distribution of arsenic, it was possible to ascertain how it had reached its destination—by absorption from the body or contamination from without; and finally (6) whether, from the amount and distribution, inferences of value could be drawn as to the amount of arsenic administered and the time of its administration. It was hoped that work then in progress might lead to an elucidation of all of these vital problems in toxicological diagnosis. Experiments conducted by himself and his co-workers had shown that the keratin tissues did in fact take up a proportionately greater amount of arsenic than other tissues of the body. In a number of men who had been given 5 mg. of arsenic a day for two months it was found that the arsenic content per 100 grams of hair was from 2 to 5 mg., roughly ten times as much as would be expected if arsenic were taken up evenly throughout the body. Similar figures had been obtained in a study of absorption by the nails and skin. Turning now to arsenic absorption from external sources, Professor Sydney Smith described an experimental study wherein a series of tubes were set up, each containing 0.5 gram of hair or nail clippings and 10 c.cm. of a solution containing 0.01 mg. of arsenic per c.cm. By decanting the liquid from each tube at definite intervals and analysing an aliquot, it was found that the tissues under study absorbed arsenic in increasing amounts, gradually attaining a concentration five times as great as that of the surrounding solution. The concentration was unaltered by increasing the period of soaking above seventy-two hours, and it was not significantly increased when the hair was soaked in a stronger arsenic solution. It was evident that both hair and nails removed from the body and soaked in an arsenic-containing solution could absorb this element till its concentration was far in excess of that in the surrounding medium. Turning, then, to the question of whether or not arsenic was capable of travelling along hair fibre, the lecturer described the distribution of arsenic in a lock of hair about 10 cm. long, of which the cut ends had been allowed to dip to the extent of about 4 cm. into a solution containing 0.1 mg. of arsenic per c.cm. An analysis made at the end of three weeks showed that, while the portions of hair furthest from the solution were quite dry and contained no arsenic, those nearer the tube were moist and contained arsenic in an amount that varied inversely with their distance from the solution. Moreover, the hair not immersed in the liquid but wetted by capillary action actually contained more arsenic than the solution, or even hair soaked in the solution. Local contamination at the proximal end had resulted in that graduated distribution which was to be expected if absorption took place from the body fluids via the hair bulb during life. It was highly significant that when the experiments were repeated, but with precautions against any movement of fluid up the outside of the fibre, the 3 cm. of hair nearest the liquid contained no arsenic. Only if contamination from an external liquid source could definitely be excluded was it then legitimate to attribute the graduated distribution of arsenic to *in vivo* absorption. The experiments suggested, moreover, that arsenic once deposited in the hair or nails was finally lost to the body, though there was a division of opinion on this subject.

Freak Suicides

Dr. GODFREY CARTER (Taunton), in a paper on freak suicides, commented on the light such cases shed upon the mental attitude of persons bent on self-destruction. What, he asked, could be made of the mentality of persons who, not content with ending their lives, exercised ingenuity, patience, and elaborate care in perfecting the setting and agents of their own destruction? Of the suicides that gave point to this problem, three were from his own experience and one had been reported to him by Dr. R. M. Coorlawala of Hyderabad. The first was that of an educated young man who had shot himself by means of a weapon improvised crudely from a pocket battery, a copper tube, some fuse wire, and an electric bell push, using as projectile a circular chisel with a sharp cutting extremity. Many days must have been given over to manufacturing this clumsy substitute for a pistol, and it was surely a mystery why the victim had not taken the easier way of using a purchasable weapon. The second case was of a working man who bound himself with ropes in a way that completely inhibited movement of his arms and legs and then threw himself into a canal a few miles from his house. It was the remarkable way in which this man bound himself and his ingenuity—recalling the feats of Houdini—that distinguished this suicide from the ordinary. Even more grotesque was the case of an elderly, happily married, working man who, before hanging himself, dressed up in a complete woman's outfit—coloured stockings, garters, corsets, and all the rest. Dr. Coorlawala's case, a report of which was specially sent by air-mail for inclusion in Dr. Carter's paper, was of an Indian, aged 24, who, having been arrested for a particularly cold-blooded murder, took a nail from the wall of his cell and drove it deeply into his own skull.

Voluntary Euthanasia

Dr. C. KILLICK MILLARD (Leicester), in opening a discussion on voluntary euthanasia, explained his reasons for advocating this measure in cases of incurable, fatal, and painful disease. He recognized the legal, practical, and ethical difficulties inherent in his proposals—the problem of safeguarding patients against designing relatives, for example, or of deciding if the applicant for euthanasia was suffering from a disease that could be neither cured nor palliated. But the enthusiastic reception that had been accorded to his proposals, and his own experience of certain diseases, warranted the conclusion that euthanasia, hedged with legal safeguards, met a widely felt need. It had been suggested that the traditional practice of administering opiates rendered his proposals superfluous. Such a view, he held, was at variance with the familiar fact that patients soon acquired a tolerance to anodyne drugs, and, to be relieved of their sufferings, had to take them in ever larger and more dangerous doses. Sir W. ARBUTHNOT LANE, supporting the proposals, said that, though he had explained them to many audiences, he had only once, and then from only one person, met with opposition. The enactment of voluntary euthanasia would liberate the medical profession from the reproach of maintaining life in patients who, tormented by incurable pain, desired nothing except a speedy and painless death. Dr. C. E. DOUGLAS (St. Andrews) said that his own experience was not in favour of the view that the proposed expedient was widely supported. In his practice he had been impressed again and again by the fortitude with which patients bore their sufferings, and by the tenacious hold that even the moribund had on life. This fortitude, he reminded the Section, was not always shared by the sufferer's friends, some of whom would no doubt welcome an expedient for getting rid of troublesome patients, especially if part of the trouble was that they had money to leave. Dr. GREENWOOD said that when the opener spoke of diseases that were "almost certainly" incurable the difficulty was to define the qualifying phrase. There was, he added, the risk that the legalizing of voluntary euthanasia would lead to neglect of the study of expedients for palliating extreme suffering. Dr. GEORGE JONES said that suicide was not a crime in Roman law of the best days. The canon lawyers, however, had retrogressed from the ancient standards, and, in the words of Sir

Henry Maine, "grievously injured civilization." John Stuart Mill had insisted over seventy years ago that acts which injured no one but the doer need not fall under the eye of the law. The application for euthanasia might be tantamount to attempted suicide, but if the act did not directly or indirectly injure another, why, he asked, trouble about it? The standards of the canon lawyers were familiar enough to Chaucer. It was from the descendants of the canonists that the opposition to euthanasia might be expected. Dr. C. E. A. Goddard (Harrow) said that thirty years ago he had read a paper advocating proposals similar to those that were put forward that day. He regretted that surgeons but rarely saw the terminal stages of diseases they had failed to cure. They could not, if they observed the phenomena of lingering death, ignore the suggested remedy.

Certification of Death

Dr. W. B. Purchase opened a discussion on the legal duty of medical practitioners in the certification of death. The doctor's duty, he said, did not end with issuing a certificate. He had to inform the coroner of any circumstances that might necessitate an inquest, even when such action involved a breach in the confidential relation between himself and the patient. In cases of violent or unnatural death—namely, death from accident, injury, operative shock, anaesthesia, want, exposure, neglect, alcoholism, drugs, or industrial disease—it was for the coroner, not the practitioner, to decide whether an inquest should be held or not. Difficulties were bound to arise, as, for example, when a patient died of chronic alcoholism; but the doctor was best advised to issue a truthful certificate and impress on the family that if he evaded the law the facts might come to light in a less desirable, even scandalous, manner. Dr. Purchase's paper provoked an interesting discussion in which Dr. W. H. Davison (Birmingham), Dr. George Jones, and the President took part. Sir William Willcox emphasized the danger of concealing the true cause of death by failing to record on the certificate all the material facts. There was one infallible rule for the guidance of the practitioner in doubt: he should go and see the coroner.

Pathologists in Coroners' Courts

Sir Bernard H. Spilsbury, in opening a discussion on this subject, said that medico-legal cases fell mainly into two groups: the one in which death was known or suspected to be unnatural, the other in which it was reported to the coroner because the cause was unknown though an unnatural cause was not suspected. It was in the second group that rare lesions were so frequently responsible for death. Thus, in a recent case within the speaker's experience, that of a woman whose illness dated from about three months before her death, only through knowing the exact position of the suprarenal glands and the technique of removing them and then subjecting them to microscopical examination, was it possible to arrive at the true cause of death—namely, Addison's disease—and avoid the error, based on changes in the small intestine, of regarding the case as one of enteritis. In another case, that of a boy aged 12 who had been quite well until fifteen hours before death, when he complained of headache, it was only after a painstaking quest that some slightly turbid cerebro-spinal fluid found at the lower end of the spinal cord suggested (and microscopy confirmed) the true diagnosis of fulminating cerebro-spinal meningitis. It was not reasonable, said Sir Bernard, to expect a general practitioner to deal satisfactorily with medico-legal cases. Encephalitis lethargica, subdural haemorrhage due to rupture of a minute cerebral aneurysm, cerebral haemorrhage into a tumour, internal hydrocephalus, some cases of disease of the spinal canal, disease of the coronary arteries, and myocarditis were some of the many conditions that the trained morbid anatomist, availing himself of whatever help he could get from histology and bacteriology, was better fitted to diagnose than the practitioner with so much else on his hands and mind. The general practitioner was in a dilemma when, having made a post-mortem examination in an apparently straightforward case, he found no satisfactory explanation of death. Sometimes he admitted the fact frankly; sometimes, having missed the actual cause, he laid the death at the door of a common chronic process; occasionally he trusted to his imagination. His remarks, said the speaker, were made not in a critical spirit, but simply to support the thesis that the proper person to investigate the cause of death was an experienced pathologist who could also carry out any laboratory examinations that might be necessary. Dr. W. H. Davison, supporting the opener, said that in his own area he had a small panel of pathologists whom he called upon whenever an investigation of the cause of death was necessary.

SECTION OF TROPICAL MEDICINE

Wednesday, July 27th

The Teaching of Tropical Medicine

With Sir Leonard Rogers, President of the Section, in the chair, Colonel W. P. MacArthur, R.A.M.C., read a paper on the teaching of tropical medicine. He confined his remarks to the teaching in the various schools of tropical medicine as they existed to-day. The usual five months' course of instruction for a diploma was long enough. Neither teachers nor examiners considered that a D.T.M. guaranteed a specialist standard in tropical medicine; all that could reasonably be expected was that students had been given a sound foundation on which they could later build as occasion offered. A defective training in general medicine was a great handicap to students of tropical disease and a sore trial to their teachers. Having a clear recollection of the examination in clinical pathology which he and his fellows had passed in order to qualify, he had recently given the identical test to a group of recently qualified men from many of the teaching schools; of over a dozen, only two came up to the standard expected and obtained in his time. Too many of those commencing a course in tropical medicine literally did not know how to use a microscope, and ought to be excluded by a preliminary test. To most members of the class parasitology was new ground, and the few animal parasites they had heard of were called by obsolete synonyms. The teaching of parasitology to such a class should be restricted to essentials. The time allotted was short, and those undergoing instruction were too often overwhelmed with masses of information new to them, which they could not sift to find the points of basic importance. It was absurd to expect a class to know the characters of one of the rarer intestinal flagellates when they could still be shaken in their identification of a malarial parasite. The teaching of parasitology should follow the lines of zoological classification, but detailed instruction should be confined to parasites of outstanding importance. The system should enable students to identify definitely only a small number of parasites; when later they encountered something they had not seen before they would be possessed of the great advantage of knowing what it was not, and in actual practice could take steps to ascertain what it was. The sin of perceiving parasites which were not there should, when committed, automatically fail any candidate in examination. But however well arranged the course and ample the material the main factor in success was the personality of the teacher. In making appointments to teaching

posts sufficient attention was not paid to the applicant's ability to teach. The main shortcomings in courses in tropical medicine were: overcrowded curriculum; unwieldy classes, with consequent lack of individual attention; shortage of staff; insufficient allotment of time for hammering in the essentials and for revision; and the often unreasonable requirements of examiners.

Professor W. Schüffner (Amsterdam) summarized his own experience as teacher of tropical medicine in Holland. The object of that teaching was to provide adequate medical service for the Dutch Malay Archipelago—a compact and isolated unit in the tropical world, with its own special climate and nosography and a sixty million population. Medical laboratories had been founded in Batavia fifty-five years ago, and were made famous by their first director, Eykman. There European medical men had received a special training. Later it was realized that this special training might be undertaken by a medical school in Holland, and the Royal Colonial Institute in 1911 organized the teaching of tropical hygiene in close collaboration with the University of Amsterdam. In addition, some years later the University of Leyden founded a chair and institute of tropical medicine. At these schools experience had shown that clinical instruction in close touch with the laboratory made a greater appeal to the average medical man than mere laboratory work alone. An increasing difficulty was the provision of clinical material, due very largely to the improved medical service in the Tropics. More and more patients were definitely cured while still in the Tropics. In the five months' course instruction was concentrated on subjects and infections of direct importance for the Malay colonies, and the students were taught how to meet situations they would have to face in remote stations devoid of laboratory facilities. Particular attention was paid to the staining and examination of blood films. The principal difficulty of the practitioner in the Tropics was to attain to two mental attitudes towards disease which were seldom well developed in one mind—prevention of disease and cure of the patient. Often in tropical medicine cure was prevention. The day had gone by when it was thought that the inferior elements of the medical profession were good enough for the Tropics; to-day only the best were just good enough.

Professor R. T. Leiper said that, as one who for twenty-six years had been partly responsible for carrying on the traditional teaching initiated by Manson, he stressed the special difficulties which confronted the teacher of tropical medicine. Manson was essentially a naturalist physician, and sought in "applied pathology"—as he then named parasitology—a means of more exact diagnosis and of understanding the manner in which individuals acquired, and could be protected from, disease. Ross, on the other hand, thought little of the individual but much of the community, and sought to influence tropical disease by educating administrators and the general public on the role of insects in the spread of disease. These two distinct schools of thought had each had important influence in the growth of tropical medicine, and explained its ever-increasing complexity. Professor Leiper blamed those clinicians who of recent years had made textbooks of tropical medicine encyclopaedias of applied zoology, and had overloaded the subject with exact information about the rarest parasites. Simplification of the course would come by recognition that parasitology, like bacteriology, was a specialist job, and should be represented by a separate appointment in every properly staffed colonial laboratory. Simplification of the examination must come from the greater recognition that, while some diseases were universal in the Tropics, others were of local importance only and might be made the subject of alternative questions grouped territorially. Practical laboratory work (whenever possible on living material) was far more important than systematic lectures and demonstrations.

Professor Warrington Yorke (Liverpool) stated that the chief influence in courses of instruction in tropical medicine was the fact that most of the common and important tropical diseases were specific infections by bacteria, spirochaetes, protozoa, or helminths. For a very large proportion of all but the bacterial infections there were specific remedies, but the medical man in the Tropics had often to work in isolated places where professional assistance and laboratory services were not available. It was therefore obligatory for the teacher to make certain that before men were let loose to practise in the Tropics they should be equipped to make a definite diagnosis, either by finding the causal organism or by obtaining positive evidence of its existence. Having done so, they should know precisely what drugs to administer, the method of their administration, and the doses in which they should be given. Failure of the diploma course to do that much for the average student was because too large a portion of the available time had to be given to matters which should have been adequately taught in the general medical curriculum. Many of those commencing a course in tropical medicine did not know how to use a microscope, and in tropical medicine the one essential instrument was the microscope. The first cause of failure was to be found right at the commencement of the medical curriculum—in the instruction in biology. In the diploma course in tropical medicine it was only by drastic pruning of all matters of subsidiary importance, by keeping strictly to essentials—among which he placed first the use of the microscope—and by frequently ensuring by the method of question and answer in tutorial classes that the student was actually grasping these essentials, that it would be possible within the time allotted to the diploma course to give the student that sound foundation on which he could later build as occasion offered.

Sir Frank Connor, I.M.S. (Calcutta), thought that from his own experience in India the teaching of tropical medicine did not take surgery into sufficient account. There were problems—for example, splenomegaly—in tropical pathology that surgery could help to elucidate, and collaboration between physician and pathologist was often fruitless because the surgeon was not asked to join them. The schools of tropical medicine had hitherto failed to realize that in the Tropics there were in the surgical field unique opportunities for research. Dr. Carmichael Low, from an experience of over thirty years' teaching and examining in tropical medicine, agreed that the main difficulty with students lay in the inferior professional technical training of so many of them. This was most noticeable in the essentials of microscopy and blood examinations. The standard for a diploma in tropical medicine should be kept unswervingly high. The better educated candidates from reputable medical schools by steady work would gain the diploma without too much difficulty. Though teachers must incorporate in their teaching the ever-growing results of research, yet constant care had to be taken not to overload the curriculum with unnecessary details. Dr. S. H. Daukes stressed the necessity for enthusiasm on the part of teacher and student as the essential factor for success. Colonel Selby Phipson, I.M.S. (Aden), as a general practitioner in a tropical area, agreed that the main teaching in a diploma course in tropical medicine should be directed to the essentials of microscopy and pathology, and should above all be practical. Dr. S. A. Wilkinson (S.M.O., Indian Railways, Delegate Bombay Branch) had found that the practical microscopy he had learnt at one of the schools of tropical medicine had been of great worth to him in

his practice in India. He pleaded that more attention should be paid in the teaching of tropical medicine to the necessity for justifying by economical results all expenditure on sanitary schemes in the Tropics.

Thursday, July 28th

YELLOW FEVER

With Dr. A. T. STANTON in the chair, Dr. W. B. JOHNSON (Nigeria) opened a discussion on recent studies in yellow fever and their application to measures for its control. His paper appears this week at page 285.

Dr. STANTON read a communication by Sir GEORGE BUCHANAN. The International Health Office, Paris, had completed an agreement for controlling the risk of introduction of infectious disease by aircraft, and had given special attention to yellow fever in Africa and America. The new work of the Rockefeller Foundation had been helpful in the working of this agreement, and did not conflict with its principles. The Convention demanded a few simple practical measures to be taken in yellow-fever-infected countries. International traffic aerodromes must be placed in situations securing freedom from yellow fever for their personnel ; aircraft before leaving should be rid of mosquitos ; and there should be medical inspection of, and inquiry about, passengers. Refusal to take a healthy person if he had been definitely exposed to yellow fever infection within six days would be given. There was, however, no intention of acting on the supposition that everyone in West Africa might have been bitten by an infected mosquito within the six days, and so be a danger on arrival in another susceptible country. The new data obtained from the work of the Rockefeller Foundation did not call for any change in that view. The Convention also prescribed the limits of the measures which uninfected countries were entitled to take in supplement to, or independently of, the measures in the infected countries. These safeguards were ample, and in actual practice would seldom have to be applied. If a non-infected country decided to refuse to admit aircraft from an infected one it would not be prevented from doing so, but it would have to present a special justification for its action. A unanimous agreement having now been reached, it should be put in operation as soon as possible. Dr. EDWARD HINDLE pointed out that the experimental evidence for the incidence of yellow fever in West Africa depended on the absolute specificity of the protection test ; yet Dinger's experiments in Amsterdam suggested that in monkeys a previous dengue might confer protection against yellow fever. The possibility of non-specific immunity could not absolutely be excluded. Results of " protection tests " in Kaduna, Northern Nigeria, were difficult to explain on any existing knowledge of transmission of yellow fever. If they indicated true endemicity, then some reservoir of infection other than the infant must be present to maintain so high an incidence in the villages. All attempts to find such a reservoir, however, had failed. There was no evidence of hereditary infection or contamination infection in the yellow fever mosquito, and he had failed to demonstrate residual virus or a carrier condition in monkeys that had recovered from yellow fever. Nevertheless, the possibility of another reservoir had not been entirely excluded. For air services the only practicable method was protective inoculation of crew and intending passengers. Sellards and Naigret had shown that inoculation of small doses of brain virus gave immunity without ill effects, and since approximately 48,000 doses could be prepared from each mouse brain the method was devoid of practical difficulties. Sir MALCOLM WATSON said that, though yellow fever was not now a great killing disease, it would become one on its introduction into East Africa, where there was every probability that the native population possessed no immunity to it. Yellow fever reached Cuba in 1648 and destroyed one-third of the population, and in his opinion yellow fever introduced by West African negro slaves must have been an important factor in the destruction of the fine race of Caribs in the West Indies and Central America. As things were at present, introduction of yellow fever into East Africa was certain. The measures so far proposed to prevent it were futile. So appalling would be the results of spread of the disease that precautions against that spread must be correspondingly stringent. There should be an immediate and complete embargo on all air traffic from West to East Africa. An investigation should be at once undertaken into the degree of immunity, if any, of the East African populations, and there should be established in London a permanent Yellow Fever Committee, consisting of medical men and administrators, and business men, to deal with this matter of the imminent spread of yellow fever to susceptible populations in East Africa and India. Dr. A. J. ORENSTEIN (South Africa) said that the essential elements of the problem of the spread of yellow fever had been encountered and solved about thirty years ago in Cuba, New Orleans, and Panama, and no new ones had appeared. The essential facts for the sanitarian were that the patient was infective during only the first three days of the disease, that the vector was a house-mosquito keeping to the room where it had fed, and that the vector must survive two weeks before it became infective. This extrinsic incubation period, demonstrated by Carter years before Reed and his co-workers established the mosquito transmission of the disease, was of the greatest automatic assistance to the sanitarian. Yellow fever was a very acute disease, drawing speedy attention to itself, and could not exist undetected for long where medical attention was available. Quite ordinary measures of a supervisory nature had proved adequate in Panama and the Gulf ports of the United States. Disinfection at air ports would be of no utility whatsoever in yellow fever. At the instance of the South African Government the League of Nations was convening next November a conference of the medical officers of African colonies, and the principal item for discussion would be protection against introduction of yellow fever by air and other traffic. There was some relation between dengue and yellow fever. They had the same vector, and the fever course in both was strikingly the same. Epidemiological experience in Cuba and Panama did not support the theory that in human cases the blood became infective before the onset of fever. There was nothing surprising about yellow fever appearing in very dry areas, for that was where water must be conserved in domestic containers, thus providing specially favourable aëdes breeding places. Speaking from his own considerable personal experience he would far rather undertake an anti-yellow-fever campaign over the whole of the Union of South Africa than an anti-malaria campaign over a few hundred square miles of the North-Eastern Transvaal.

Colonel S. P. JAMES said that the " protection tests " had shown, not that the native throughout West Africa was as saturated with yellow fever as with malaria, but that there were large areas where the disease had never existed and others where it existed formerly but had been entirely absent for ten or more years ; and that, even where the disease existed in epidemic form, by no means all the native inhabitants were infected with it. Freetown, Sierra Leone—formerly " the white man's grave " because of yellow fever—had had no case since 1910. Similar results had been obtained in many other places. Indeed, the ease with which the vector of yellow fever could be eliminated from defined localities and aerodromes by measures not involving drainage or clearing of streams,

swamps, and ditches, the rapidity with which aircraft could be freed from it by spraying or other simple means, and with the revelation of the "protection test" that the virus of yellow fever was not so widely distributed in West Africa as was formerly believed, warranted a hopeful attitude. Conviction that yellow fever was conveyed only by a mosquito was equalled only by conviction that it was not conveyed by baggage. In 1902 the late Surgeon H. R. Carter recorded the observations of thirty years on baggage shipped to infectible ports from the infected ports of Vera Cruz, Havana, and Santiago de Cuba. The record included observations on baggage from Havana alone of 300,000 persons, many of whom had resided in yellow-fever-infected houses. In no instance was yellow fever conveyed by baggage or by mosquitos carried in it. Dr. G. MARSHALL FINDLAY said that there were four methods of immunizing against yellow fever, as with other diseases due to an ultra-microscopic virus: (1) by immune or hyperimmune serum; (2) by a vaccine of killed or attenuated virus; (3) by a mixture of virus and immune serum; and (4) by a biologically modified virus. Cases of yellow fever had occurred a few weeks after large doses of immune serum. A vaccine composed of monkey tissues containing yellow fever virus had given comparatively short immunity; killed viruses gave little or no immunity, and the standardization of virus attenuated by formalin or carbolic acid was very difficult. Monkeys might develop lasting immunity after injection of a mixture of virus-in-monkey-tissue and immune serum. The standardization of this mixture was difficult. Theiler, in 1930, had shown that mice might be infected intracerebrally with yellow fever virus, and that after repeated passage through mice the virus had lost its pathogenicity for monkeys except when inoculated intracerebrally, when it produced fatal meningo-encephalitis. This apparently biologically modified mouse-virus strain could be easily titrated and mixtures of immune serum and the mouse virus had given immunity to monkeys and men. A biologically modified virus had already given excellent results in other virus diseases: in fowl-pox a pigeon strain of the virus immunized fowls against a fowl strain of fowl-pox. Dr. W. SCHÜFFNER (Amsterdam) stated that the recent knowledge that yellow fever may be contaminative had been gained at the cost of the lives of our best investigators. He hesitated to accept as conclusive the results of the "mouse protection test." There might be some other disease giving rise to partial immunity to yellow fever. Work on the relation of yellow fever and dengue was proceeding in Amsterdam under Professor Snyder. They had injected many volunteers with the Java and Sumatra strain of dengue, and their serums would be used later in connexion with the mouse protection test for yellow fever. In that test the quantity of virus used must be very accurately gauged for results to be reliable. The Dutch Government had made it a punishable offence to import for scientific purposes yellow fever virus into the Dutch East Indies; the Indian Government were taking similar precautions, and other Governments should follow before it was too late. Colonel F. P. MACKIE (I.M.S., Bombay) remarked that the Government of India had now absolutely interdicted the introduction of yellow fever virus for laboratory purposes. Although yellow fever had not been recorded in India, it was necessary to ascertain whether the inhabitants of India were immune to it. A preliminary test had been made in Madras by Colonel King: out of fifty-three serums from natives who were twice tested, five showed some protective power in one test or the other. In two serums this power seemed quite definite. These positive cases might have been exposed to yellow fever in India or in Africa, or some other disease such as dengue might be able to produce a non-specific immune reaction to yellow fever.

OTHER PAPERS

Professor D. B. BLACKLOCK (Liverpool) spoke on the relation of yaws to syphilis. Professor WARRINGTON YORKE (Liverpool) read a paper on drug resistance, with special reference to trypanosomiasis. He gave an account of experimental work on this subject. Drug resistance was a stable character inherent in the trypanosomes themselves and in no way dependent on the particular host in which the parasite happened to find itself. Experiments had shown that drug-resistant trypanosomes owed their resistance to the fact that they did not absorb aromatic arsenicals even though the latter were present in concentrations rapidly fatal to normal strains. It seemed probable that a considerable number of cases of human trypanosomiasis treated with aromatic arsenicals did develop resistant infections. This was important, because once a strain had become drug-resistant it retained the character, apparently unimpaired for years. Further, resistance to one of the aromatic arsenicals implied resistance to all the aromatic compounds of arsenic and antimony. Experience suggested that the development of drug resistance was slow to begin with, but, once established, developed with great rapidity to a degree of complete resistance. Dr. CLEMENT CHESTERMAN (Congo) read a communication from Dr. RODHAIN (Brussels). Seven trypanosome strains isolated from humans from three Congo regions had been studied in guinea-pigs. That study had shown that tryparsamide resistance was an acquired rather than a natural characteristic, and was habitually transmitted from one species of experimental animal to another. Tryparsamide-resistant strains in humans maintained that resistance in animals; large doses of the drug were therefore necessary in treatment. No relation existed between resistance to "Bayer 205" and to tryparsamide in any given strain. "Bayer 205" resistance was a natural rather than an acquired characteristic. Combined treatment was therefore essential. If it were shown that drug resistance was maintained through cyclical transmission by the tsetse fly, drug prophylaxis was checked. Dr. Chesterman had recently examined his records for over ten years. The percentage of cures for large, medium, and small tryparsamide doses had remained constant. Development of resistant strains in human patients was probably, therefore, not very important in prophylaxis, though very important for individuals. His records showed that with large doses of tryparsamide 50 per cent. of second-stage trypanosomiasis was curable; with medium doses (3 grams a week) 30 per cent.; and with small doses (2 grams or less) only 10 to 13 per cent. By improper dose and grading patients could be definitely condemned to death. He suggested that atoxyl never reached trypanosomes in the central nervous system, and tryparsamide did. Thus apparently atoxyl-resistant patients might be cured by tryparsamide, which could never cure tryparsamide-resistant cases. Even if drug resistance of strains was shown to be transmissible through glossinae, ambulatory treatment of natives should not be abandoned. He had shown its value in clearing up whole regions.

Colonel F. P. MACKIE (I.M.S.) read a paper by Dr. P. B. P. NAIDU and himself on the serum therapy of plague. He said that an antiplague serum more potent than any hitherto available had been produced. In its preparation cattle were chosen in preference to horses; a highly virulent strain of *B. pestis* was maintained throughout. Use of the serum as a curative measure resulted in saving the lives of a high proportion of rats and rabbits compared with controls and with animals treated with other types of serum. In a small human epidemic results were very promising. It was probable that in early cases septicaemia might be prevented, and that even when established the use of Haffkine Institute serum would bring about recovery in a number of cases.

AETIOLOGY OF DISSEMINATED SCLEROSIS

THE SUPPOSED VIRUS

A statement on this subject by Dr. B. Halley Stewart was read at the Section of Neurology on Thursday, July 28th. The President of the Section, Sir Farquhar Buzzard, introducing Dr. Stewart, said:

May I preface Dr. Halley Stewart's remarks with a few words. Dr. Halley Stewart has very kindly consented to give us shortly the results of his father, Sir Halley Stewart's, generous offer to finance a research into the alleged association of disseminated sclerosis with a specific micro-organism. In view of the widespread interest taken in this alleged discovery during the last two or three years by the profession generally, I thought that Dr. Halley Stewart's report would be of great value, not only to us, but to our patients.

The full text of the statement is as follows:

My connexion with Miss Chevassut's work began with the provision by the Halley Stewart Trust of an Institute at Hampstead for her research work. Having retired from practice, I accepted, at my father's request, the position of medical superintendent. In the statement which follows, I make no attempt to interpret what has transpired, leaving the facts to tell their own story.

On May 2nd, 1930, the Medical Research Council invited four neurologists to send specimens of cerebro-spinal fluid to Miss Chevassut. From July to November the fluids from thirty-two cases were sent to her at the Westminster Laboratory, fifteen being from patients suffering from disseminated sclerosis, and the remainder from cases of other diseases. The only "positive" returned by Miss Chevassut was that of a boy aged 15 years, suffering from rheumatic chorea, and she finally reported that in fourteen instances (nearly 44 per cent.) the cerebro-spinal fluids were contaminated. Miss Chevassut specifically attributed her failure to: (1) the transportation of cerebro-spinal fluid from Queen Square Hospital and elsewhere to the Westminster Laboratory, and (2) contaminations. At a meeting of neurologists and other experts at the office of the Medical Research Council in December, 1930, Miss Chevassut was asked to submit her work to a further test, under her own conditions, but the invitation was refused.

It was early in 1931 that the Halley Stewart Trust decided to give Miss Chevassut increased facilities for her work and further opportunities for establishing her claims. Premises were taken at 30, Chesterfield Gardens, Hampstead, and furnished with all the equipment required by Miss Chevassut for her work. A nursing staff and accommodation for twelve patients were provided in the same building, thus avoiding the necessity of transporting cerebro-spinal fluid from one institution to another. Miss Chevassut, who was a grantee of the Trust, was given the services of Mr. Lavington, who had acted as her laboratory assistant during her investigations at Westminster Hospital.

The institute at Chesterfield Gardens was opened at the end of March, 1931, and from this date until the end of September (six months) 162 cases (including readmissions) were treated. The records made by Miss Chevassut show that the cerebro-spinal fluid in 121 cases (that is, 74.7 per cent.) was positive. In October her incubator contained about ninety culture tubes which purported to be those of her virus.

In September, 1931, Miss Chevassut submitted to the Trustees a report on her first six months' work at the institute. It comprised twenty foolscap sheets of closely typed matter of a highly technical nature, and covered nineteen different investigations. These included researches of bacteriological, chemical, and physical natures, most of which, in order to yield results of any value, required considerable technical skill and a wide knowledge of the principles of chemistry, physics, and bacteriology. It was submitted by the Trustees to a committee of three eminent experts on pathology, and particularly on bacteria and viruses. Captain S. R. Douglas, F.R.S., of the scientific staff of the Medical Research Council, was a member of this committee. They kindly examined the report and gave the Trustees the benefit of their opinion, which was entirely unfavourable. The Committee reported that it was not possible during a period of six months for such a volume of work to be satisfactorily performed by one person, and that Miss Chevassut's report had no scientific value. Captain Douglas pointed out that three passages, each of considerable length, were almost identical in wording to parts of three articles which had previously appeared in scientific journals.

Early in October, 1931, I returned to the laboratory, which I had left about the middle of May because Miss Chevassut resented my presence there. The four weeks that followed my return were a period of difficult and distasteful work. I informed Miss Chevassut that I proposed instituting a system of controls of all the lumbar punctures, she and I independently taking some cerebro-spinal fluid from each case, in order that Lavington and I on the one hand, and she on the other, should work separately along similar lines with different incubators. During this month we had fifteen cases. From day to day it became increasingly difficult to obtain from Miss Chevassut a definite statement as to whether her virus was present in the cerebro-spinal fluids of the various cases. On Friday, October 16th, the assistant and I discovered that Miss Chevassut had removed from her incubator every culture tube which showed a visible growth. These were never returned to the institute. The slides she now made were from four or five culture tubes which she carried about with her in the pocket of her white coat.

Previously we had submitted to Captain Douglas four subcultures of specimens from Miss Chevassut's incubator. Two were from tubes bearing the names of patients—one being a liquid culture and the other on a solid medium. The other subcultures were made from two of the remaining tubes (about eighty in number), all of which appeared to bear code markings. Captain Douglas reported that the growth in each of the four tubes received by him was a pure culture of the virus of bovine pleuropneumonia. When questioned about this several weeks later at a special meeting of the Trustees on December 14th, Miss Chevassut stated that the presence of this virus in culture tubes bearing the names of patients was due to the fact that if specimens of cerebro-spinal fluid proved negative or vaccine controls sterile, she was in the habit of using these tubes for the cultivation of the organism of bovine pleuropneumonia without removing the patients' names or in any way relabelling them.

On the evening of October 30th the assistant found that all our control tubes (forty-nine in number) had been removed from our incubator and dummy tubes put in their place. Before his arrival at the laboratory next morning Miss Chevassut returned our controls to our incubator, and I am of the opinion that she was not aware that we knew she had removed them. Two days previously our incubator, which had been working perfectly, was discovered to be overheated, the thermometer registering a temperature of 50° C. There was nothing amiss with the mechanism, but the screw regulating the temperature had been turned to its limit.

In her report to the Trustees Miss Chevassut stated that owing to a new cultural method on a solid medium she was able to make subcultures at very frequent intervals (every twenty-four hours). The Committee therefore wished to obtain, for independent investigation, culture tubes certified by Miss Chevassut to contain her virus. On Tuesday, November 3rd, Captain Douglas called at the institute, where he remained about an hour. He examined a number of slides and cultures, and finally asked Miss Chevassut to give him a tube of her virus. Miss Chevassut expressed regret that she had not one in her possession at the moment, but promised to furnish a specimen at the earliest opportunity. We had in our incubator two cultures certified by Miss Chevassut to be those of her virus, and also considered by Lavington and me, microscopically and macroscopically, to be typical of what Miss Chevassut had repeatedly demonstrated as her virus. In the absence of any specimen from Miss

Chevassut I handed these two cultures to Captain Douglas. Unfortunately they were dead. Miss Chevassut subsequently admitted that on the night she removed our controls from our incubator she killed them by submitting them to a temperature of 60° C. for one and a half hours. She had therefore allowed me to hand these specimens to Captain Douglas knowing that they had been killed by her a few days previously. She stated later as her reason for killing our controls that she suspected that Lavington and I had some cultures of bovine pleuropneumonia in our incubator, and that, as she regarded us as ignorant and incompetent, she destroyed them to avert danger to us and to the community in general. I take this opportunity of stating that Mr. Lavington is a man of ability, with an extensive knowledge of laboratory work and technique. He had worked for nearly three years with Miss Chevassut, and had been at the Chesterfield Gardens Institute from the first. He had an intimate knowledge of Miss Chevassut's methods, and has done an immense amount of work with her and on her behalf. On November 4th, the day following his visit to the institute, Miss Chevassut wrote to Captain Douglas that she had had cultures of bovine pleuropneumonia in her incubator and that she feared some mistake may have been made. It is necessary here to record that, although the work at the institute had been in progress for over seven months, this was the first occasion on which Miss Chevassut had hinted that she had in her incubator, or even in her possession, any cultures or subcultures of this organism. It will be recalled that in her original paper in the *Lancet* of March 15th, 1930, Miss Chevassut described her virus as bearing a striking resemblance to that of bovine pleuropneumonia. Further, it has not been possible to trace any instance where Miss Chevassut has parted with any culture certified by her to be that of her virus to an independent investigator, though she has been repeatedly requested to do so.

During the six months April to September, Miss Chevassut returned a monthly average of 74 per cent. of positive results. From the date of the institution of our controls in October, her average of positives for this month fell to 37 per cent., and she pronounced her last six cases to be negative, four of them being returned as contaminated.

On November 3rd, shortly after the departure of Captain Douglas, Miss Chevassut left the institute and did not return until summoned by the Trustees to the special meeting on December 14th, at which Sir Henry Dale and Captain Douglas were present. Miss Chevassut was offered a final chance of establishing her claim, and given the sole possession of the laboratory and the right to admit twelve cases over a period of a full month, in which to provide positive cultures for verification. She accepted these conditions but only admitted six patients, and having failed to produce from them a solitary culture she withdrew from the institute on January 7th, a week before the expiration of the allotted month, and indicated her intention not to return. She stated that four of the six cases were contaminated. These—added to her last six cases in October (which she declared to be negative)—make a total of twelve consecutive instances in which she failed to return a positive result. In her original paper on disseminated sclerosis she stated that in a series of 183 cases she obained 93 per cent. of positives.

In view of the Committee's adverse report and Miss Chevassut's failure to produce a culture with the properties and appearances described in her report as characteristic of her disseminated sclerosis organism for verification by independent investigators, the Trustees had no alternative but to close the institute to her and abandon the trial of her method.

From October 17th onward the assistant and I had the opportunity of examining the cerebro-spinal fluids of thirty-two cases, under conditions identical to those under which Miss Chevassut was working, and her methods were followed with meticulous care in all details. In every instance our results were negative, our culture tubes remaining sterile, and we were unable to find under the microscope, or by macroscopic methods, anything that bore the least resemblance to what Miss Chevassut had repeatedly demonstrated to us and to others as her virus. In no instance did we get any contaminations. We always saw many spherical bodies of various sizes and appearances, but what Miss Chevassut demonstrated as her virus is quite unmistakable and characteristic. It is best described as resembling a signet ring, and microscopically this is the outstanding feature. The attachment of a granule to the side of a ring is responsible for this appearance. I have repeatedly seen in single fields demonstrated by Miss Chevassut many hundreds of these forms. The movement, which is almost invariably present, is also typical. It is best described as a tumbling movement, over and over, the type one would expect from a body somewhat unevenly weighted.

At my request the Assistant Medical Officer of the Institute drew up a list of the patients treated, with brief comments on each case. The summary of his conclusions is as follows:

	Per cent.
1. Cases showing considerable improvement	5.80
2. ,, ,, slight improvement	18.85
3. ,, ,, no change of condition	36.23
4. ,, definitely worse	39.13

These figures were submitted to Dr. F. M. R. Walshe, who kindly gave the Trustees his views concerning them. Dr. Walshe wrote, *inter alia*:

"Your results amount roughly to this, that 25 per cent. of cases showed some measure of improvement (trivial in 20 per cent.) and 75 per cent. showed no improvement or definitely retrogressed. I may say with confidence these results are markedly worse than hospital records would show for the treatment on other lines of disseminated sclerosis, and also are not so good as a similar number of wholly untreated cases would probably show. I can only conclude from your figures that the treatment you have been investigating must aggravate the malady, and that the patients so treated are worse off than if they had been left alone."

In conclusion I wish to take this opportunity of explaining why I have occupied the time of so distinguished an assembly. The facts and circumstances were submitted to your president, and to others, who are of the opinion that it is desirable for a statement of Miss Chevassut's methods and of her work on disseminated sclerosis to be put before this meeting in view of the wide publicity they have received. This I have endeavoured to do as briefly as possible. Mine has indeed been an uncongenial and thankless task.

MATERNAL MORTALITY AND MORBIDITY

FINAL REPORT OF DEPARTMENTAL COMMITTEE

The final report of the Departmental Committee appointed by Mr. Chamberlain in 1928

to advise upon the application to maternal mortality and morbidity of the medical and surgical knowledge at present available, and to inquire into the needs and direction of further research work,

was published last week. It must be related to the interim report of that committee which was issued exactly two years ago, and which was fully described and noticed in the *Journal* of August 9th, 1930 (pp. 223 and 218). Both reports are signed by Sir George Newman as chairman and by all the members of the committee, without reservations. Unlike the interim report, the final report sets out in a separate chapter the conclusions and recommendations of the committee, but, though this chapter is admirably clear and relatively full, it is to be hoped that very few readers who are interested in the medical or administrative questions considered will allow their attention to be confined to it, and neglect the body of the report.

Investigation of Maternal Deaths

It will be remembered that the interim report was largely occupied by an analysis and consideration of 2,000 maternal deaths investigated by experienced medical officers throughout the country in accordance with an arrangement entered into early in 1928. The object was a practical one, and the method adopted was to attempt to discover in each case the "primary avoidable factor"—that is, the first omission, mistake, or misjudgement in the train of events which led to the fatal result. Such a primary avoidable factor was discovered definitely in some 48 per cent. of the cases, and it could be placed in one of four categories: (1) omission or inadequacy of ante-natal examination; (2) error of judgement in management; (3) lack of reasonable facilities for proper treatment; and (4) negligence of the patient or her friends, usually in failing to follow the doctor's advice or in ignoring obvious symptoms. The committee pointed out that "caution must be exercised in drawing conclusions from the evidence obtained from these investigations," but the final report sets out results from an analysis of a further 3,805 maternal deaths which agree very closely with those obtained from the examination of the first series. Taking the two series together, there were 4,655 deaths directly due to child-bearing and 1,150 due to intercurrent disease. If the cases not relevant to this part of the inquiry and those in which information was insufficient to justify a definite conclusion are deducted, the percentage showing a primary avoidable factor is 45.9, and if allowance is made for cases in which the data were incomplete the broad conclusion is warranted that at least one-half of the maternal deaths occurring in this country were preventable. In 15.3 per cent. of the total deaths the avoidable factor was held to be failure of ante-natal care; in 19.1 error of judgement; in 3.7 lack of facilities; and in 7.7 negligence of the patient. It is noted that:

> "A primary avoidable factor was found in 59 per cent. of the cases dying from sepsis following complicated labour, and in as many as 73 per cent. of the cases dying from eclampsia. The inference is either that our standard of midwifery practice is not high enough or that our knowledge of the best methods of treatment in these cases is still inadequate."

Such investigations as these are obviously of great value, and the committee advises that local authorities should be encouraged to continue inquiries on these lines, the confidential character of the reports being maintained, but they pronounce quite emphatically against the suggestion (consistently opposed by the British Medical Association) that there should be a compulsory inquest or post-mortem examination, or both, in all cases of maternal death.

Puerperal Sepsis

Their examination of the reports of those cases in which death was due to septic infection, together with the results of bacteriological investigation at Queen Charlotte's Hospital, University College Hospital, and in Sheffield, Edinburgh, Glasgow, Aberdeen, and elsewhere, leads the committee to certain definite conclusions. Sepsis following normal labour is responsible for 18 per cent. of all deaths directly due to child-bearing. The majority are due to sporadic infection, and are preventable by a conscientious technique. Sepsis following difficult labour accounts for 19 per cent. of such deaths, and in this group it is serious injury to the maternal tissues which is the most important factor in determining the onset of a fatal infection. In not less than 85 per cent. of the normal cases in which sepsis occurs the agent is *Streptococcus pyogenes*. In a large proportion of these cases the method of infection is by the transfer of the microbes from the throat or nose of someone in attendance on the mother during childbirth or the first few days of the puerperium. This may occur by droplet-spray directly on the vulva, but it may be indirectly by way of hands, instruments, or dressings. In some cases the streptococci are conveyed by the mother's fingers from her own throat or nose; they may also have been originally present in the genital tract. In sepsis following difficult labour the same sources and modes of infection are, of course, present; but here there is an increased chance of endogenous infection by anaerobic streptococci or by *B. coli*, either present *in situ* or reaching the genital tract by way of the blood stream. To minimize these dangers the obstetric toilet and routine should be revised, and the committee definitely recommends: (1) the use of adequate masks worn over both nose and mouth by all those in attendance on the patient and by any other persons present; (2) the use of rubber gloves with scrupulous antiseptic precautions; (3) the active discouragement of talking in the room of confinement; and (4) the avoidance of any vaginal examination in a straightforward case after the membranes have ruptured. Detailed suggestions as to the routine conduct of midwifery are given, and imperfections in the present domestic or institutional regime are pointed out. The committee recognizes that no rigid methods of procedure can be specified for all cases, and that, where there can be unremitting supervision throughout, the meticulousness of certain features may be modified. It feels it is its duty, however, to emphasize these points, and the remarks should certainly be read and considered by every obstetrician.

Other Causes of Maternal Deaths

With regard to other causes of maternal deaths, the committee is of opinion that, in relation to toxaemias, the examination of the urine and the estimation of blood pressure during pregnancy are not as effectively carried out as they should be, and that it is advisable that midwives should be trained to make blood pressure determinations. With regard to haemorrhage, it finds that "warning haemorrhage" is not sufficiently regarded, and that doctors do not make sufficient use of intravenous injection or of blood transfusion in cases which require it. The committee believes that both in the case of toxaemia and in the case of warning haemorrhage the pregnant woman should be placed in an institution more often and at an earlier stage than at present, and that there is insufficient hospital accommodation for cases of heart disease, tuberculosis, and nephritis associated with pregnancy.

A Comparison with Certain European Countries

In a broad survey of the statistics of maternal mortality two facts are at once evident: (1) that in certain European countries—Holland, Sweden, Denmark—the mortality rate is definitely less than that for England and Wales; and (2) that in certain districts in this country—especially Wales, Lancashire, and the West Riding—the rate is markedly higher than elsewhere. Under the former of these headings it is probable that, except in the case of Holland, where methods of certification and classification follow the same lines as in England, the comparison is less favourable to this country than it should be, owing to discrepancies of recording deaths and calculating rates. But in view of these facts the committee arranged that certain of its members or representatives should investigate the conditions in the countries named, and others in the three regions named. Most interesting details as to each of these special inquiries are given in the report. In Holland and in the Scandinavian countries the status of the midwife is definitely higher than in this country and her training is longer. The training of the medical student is also longer, more practical, and somewhat more specialized than here. Ante-natal work does

not appear to be more effective in itself, but for the bulk of the population in these countries it is much more accessible than it is, say, in Wales or Cumberland. Apart from details, however, one important conclusion emerges from these combined investigations. The former may be said to demonstrate it positively, the latter negatively. In the countries named housing, habits of life, general hygienic conditions, opportunities for outdoor exercise, balance of diet with due consumption of milk during puberty and adolescence, and consequently the general health and development of the population, and the physique of the women (incidence of contracted pelvis, etc.) are all better than the average, while in Wales and the English districts named they are below it. "These are but examples of the broad fact that anything which impairs a sound physique and physiological muscular and bony development is prejudicial to a healthy pregnancy and normal childbirth."

"It is the whole physical upbringing of girls, in infancy, in school age, and in adolescence, to which we must give attention if we would lay enduring foundations of sound physique in women, enabling them to withstand the stresses and strains inseparable from pregnancy and maternity. A healthy race of women does not grow by chance or caprice, nor is it assured by spasmodic and often ill-directed efforts of hygiene after adolescence. It is assured only by the systematic cultivation of the physiological life and obedience to physiological law from birth upwards. The problem of a high maternal mortality rate, especially in a time of rapid social development in an industrial and urbanized community, cannot be solved by any narrow or short-cut methods applied at the last minute. No intelligent community which disregards or is careless of the bodily health of its childhood and adolescent womanhood should be surprised if their physical and mental capacity fails satisfactorily to meet the natural demands of human life. . . . The committee desire to emphasize the necessity for the public recognition of the intelligent application and direction of *all* the medical services, and the vital relation which exists between them and the ultimate reduction of maternal mortality."

Anaesthesia in Labour

The chapter on maternal morbidity makes evident the importance of this aspect of the subject, and clarifies the position in respect to certain diseases. Attention should be drawn also to some other pronouncements. With regard to anaesthesia in labour, the committee does not add specifically to what was said in its interim report, but the careful paragraph (p. 43) in which it says they "would regret a general demand for anaesthesia" should be noted, as also the statements that:

"One of the features of Dutch midwifery which most impresses a visitor from Great Britain is the attitude towards anaesthesia in labour. The routine practice is to deprecate entirely the employment of general anaesthesia in normal cases. Even the higher classes who are in a position to command it rarely ask for it. Teachers and practitioners expressed the opinion that recourse to anaesthesia for normal midwifery was bad in that it tended on the one hand to delay the natural process, and on the other to increase the tendency to the adoption of artificial aids to delivery. Midwives are not permitted to use sedative drugs before the birth of the child." Again, "Swedish obstetricians discountenance the use of anaesthetics and analgesics on account of their liability to interfere with the course of natural labour. Midwives never give the anaesthetic."

These facts have their importance in relation to certain recent or present misdirected efforts in this country.

Maternal Services and Hospitals

With regard to the development of maternity services and hospitals, the main points made by the report are that new maternity accommodation should, where practicable, be associated with general hospitals; that large maternity units are disadvantageous; that abortion cases should not be admitted to maternity wards; that cases of puerperal sepsis, wherever arising, should be treated only in an entirely separate block, separately staffed; that young obstetricians and gynaecologists should be encouraged to establish themselves in non-teaching provincial centres; that ante-natal clinics are too often conducted by those who are not practical obstetricians; and that therefore general practitioners and private obstetricians should be much more freely used for ante-natal work. In regard to education, it is noted that post-graduate facilities for older practitioners are inadequate, and that, largely owing to the misuse of material for midwives who will not practise, the number of cases available for the training of medical students is quite insufficient. Action is urgently called for.

Correspondence

ALUMINIUM AND HEALTH

Sir,—With reference to the letter of Dr. Leo Spira in the *Journal* of July 30th, it is evident that Underhill and Peterman think that aluminium is far from harmless. Nevertheless, their findings, as revealed by the figures in their tables for the amounts of aluminium present in tissues after oral administration, are excellent evidence against their own conclusions.

On the general question of the use of aluminium, the last word may not yet have been said, for further investigation may lead to fresh discoveries; nevertheless, there is already ample evidence, not only on animals, but also on human beings, to indicate that aluminium is not more toxic than iron.

I feel sure that if the work which has already been done were widely known, little more would be heard of the dangers of aluminium. It is one of the tragedies of scientific work that the great bulk of it never reaches the ears of medical men, or at least, if it reaches their ears at the time when the work is done, it is forgotten after a few years.

The existing evidence is so clear that I do not feel it is right that those in practice should state that in their opinion aluminium is harmful, unless they have first of all taken the trouble to carry out carefully controlled experiments on a scale which would justify them in criticizing this evidence. After all, the use of aluminium affects a large British industry, and it is easy to see that a scare started by honest but mistaken people may affect large bodies of workmen engaged in the industry. I have no personal interest in this matter, either for or against aluminium, but it seems to me that a grave responsibility rests upon those who are engaged at the present moment in this anti-aluminium campaign.—I am, etc.,

London, W.C., Aug. 3rd. J. H. Burn.

PATHOGENESIS OF IDIOPATHIC HYDROCELE

Sir,—In an article in the *Journal* of August 6th, calling attention to a revival of the phenol injection treatment of hydrocele of the tunica vaginalis, the author observes that during operative treatment of hydrocele no marked signs of inflammation are to be observed.

It will be conceded that in the obstructive hydrocele of filariasis, and in that occurring after scarring of the inguinal region, no such signs are to be expected or found, as also in the infantile variety and in that accompanying neoplasms. It will similarly be agreed that hydrocele may be secondary to such conditions as pyogenic, syphilitic, or tuberculous infections of the testis and epididymis. What is in dispute is the ordinary "idiopathic" hydrocele with no *gross* demonstrable

disease of the external genital organs. In the first place, it is to be observed that the fluid is not that to be expected in a mere passive effusion—it is highly albuminous, becoming solid on boiling, as is well known, and is markedly different from the pale, slightly albuminous fluid of obviously obstructive hydrocele.

I have been observing the condition of the testis and epididymis during hydrocele operations for many years, and state emphatically that in no case can one fail to demonstrate signs of infection in the epididymis immediately alongside the testis in the form of oedematous, reddened plaques or patches, which on rubbing with the finger show the "speckling" similarly found over a duodenal ulcer or a peridiverticulitis. The source of infection is in a chronic prostato-vesiculitis, which may or may not be associated with pyuria or bacteriuria (more often it is not, as in the case of the trigonitis of the female). Some cases of hydrocele, indeed (few, however), react to the exhibition of urinary antiseptics. The source of such non-urethral infections of the prostate is, I believe, lymphatic, and in many cases is due to rectal and anal abrasions and other lesions.

It may be noted in parenthesis that the presence of a slight hydrocele, often bilateral, in an oldish man should always call attention to the possibility of prostatic hypertrophy, and particularly to the intermittent infections that cause such rapid variations in the symptoms of this condition.—I am, etc.,

London, W.1, Aug. 7th. C. JENNINGS MARSHALL.

BLOOD TRANSFUSION

SIR,—I was greatly interested in Mr. A. M. A. Moore's note on blood transfusion in the *Journal* of July 23rd, because his technique so closely resembles the one I have adopted as the result of a very extensive experience. I differ from him in one or two details, and I am egotistical enough to consider my methods the better.

I prefer the donor to have his arm by his side, since I have found that when it is abducted, as in Mr. Moore's method, it is more tiring for the donor and less steady: as a result, the needle is more likely to be displaced. It is unpardonable to use a venesection needle without first anaesthetizing the skin. The very finest of hypodermic needles—No. 18 or 20—should be used, and personally I prefer a 2.5 solution of novocain. I consider that it is best to inject it into the skin just to one side of the selected vein and not immediately over it, as I find that the resultant wheal tends to obscure the vein. A considerable amount of force is sometimes necessary to push a large-bore venesection needle through the skin, and if it is pushed through immediately over the vein there is a risk that, when the skin resistance is overcome, the needle will suddenly plunge into and through the vein and extravasation of blood result. When this happens it is useless to try to use the damaged vein. If the anaesthetized wheal is made to one side of the selected vein, the venesection needle can be pushed through it slowly and deliberately without any risk of damage. When the point is through the skin the needle is moved so that it lies over the vein. Holding the needle with its bevel upwards and in the same line as the vein, push it into the vein. The whole procedure is deliberate and painless. While, as Mr. Moore says, it would seem more reasonable to insert the needle with the point directed towards the hand, yet I am convinced that in practice the direction of the needle has no influence on the flow, and generally it is simpler to insert it in a proximal direction.

Whenever possible the donor should be asked which arm he would prefer to be used—generally speaking, if he is right-handed the left arm should be used. Not uncommonly he complains after a few minutes that the combined effect of the pressure of the sphygmomanometer and of opening and closing his hand has tired him. When this happens the surgeon or his assistant should squeeze the donor's forearm rhythmically about thirty to forty times per minute. The method of transfusion described by Mr. Moore fulfils the advice given by that great French surgeon Doyen, "Suppress every manœuvre and every instrument which is not absolutely indispensable." Nowhere is simplicity of technique more important than in blood transfusion.—I am, etc.,

Liverpool, Aug. 1st. J. BAGOT OLDHAM, F.R.C.S.

TUBERCULOSIS AND THE MILK SUPPLY

SIR,—Had I suggested that any city in Ireland was more sanitary than Belfast I could not have merited a more vigorous reply than that of Dr. Charles Thomson (August 6th). I agree that the convictions for selling tuberculous meat give no indication of the amount of tuberculous meat on sale, unless we know the efficiency or inefficiency of the meat inspection. Even so, an absence of convictions in an area without a public slaughterhouse might indicate the need for inquiry. Government Departments have their difficulties, not least in inducing backward public authorities to do their duty. Yet in certain directions there is apathy. Nor am I alone in that opinion. At the Mansion House on July 11th Lord Moynihan (*British Medical Journal*, July 16th, p. 118), referring to his maiden speech in the House of Lords, stated that the reply of the representative of the Ministry of Agriculture was "jejune and unhelpful," and that "the Ministry did not seem to recognize what a really serious burden of suffering and disease was inflicted upon the people of this country through the drinking of impure milk." Far be it from me to suggest that before making that speech Lord Moynihan should have written to Belfast!

As regards the immunization of *adults* by tuberculous milk, Dr. Thomson writes: "Surely this dangerous theory as to immunization died years ago of debility at birth." That is rhetoric. Let us consider the facts. The drinking of tuberculous milk is a haphazard method of immunization, but, *faute de mieux*, it may be better than nothing, and having regard to the infrequency of bovine infection in adults it can scarcely be described as dangerous. A non-tuberculous man or animal has never yet been immunized against tubercle except by inoculation with living tubercle bacilli. When Koch first immunized bovines against bovine tuberculosis he inoculated a living culture of bacilli from human sources. The same principle underlies Calmette's prophylactic vaccination with B.C.G. A non-tuberculous man or animal has never yet been immunized with tuberculin or with dead tubercle bacilli for any length of time. That does not affect the value of tuberculin in treatment. In the majority of patients suffering from tuberculosis in the lungs or elsewhere it is possible to raise immunity to tuberculin even a millionfold, and that increased immunity is associated with the disappearance of symptoms. In these cases living tubercle bacilli in the body are, in conjunction with the injected tuberculin, playing a major part in immunization.

Since Dr. Thomson states that the theory of immunization by tuberculous milk "died years ago," I would invite him to read the authorities quoted on page 87 of Dr. P. D'Arcy Hart's recent report (Medical Research Council, Special Report Series, No. 164). Dr. Thomson has invited me to read a book on constitutional law! That invitation I decline, but if ever the opportunity offers I shall be very glad to accept his kind invitation to have a pleasant drive round Belfast.—I am, etc.,

London, W.8, Aug. 6th. HALLIDAY SUTHERLAND.

ANATOMY AND PROLAPSE

SIR,—A leading article on uterine prolapse in the *Journal* of July 9th refers to recent contributions on this subject. I should like to draw attention to discrepancies found in these contributions. Both Mestitz's description of Halban's operation and Miller's article on prolapse emphasize the importance of a complete comprehension of the details of pelvic anatomy, but unfortunately both articles fall short of this ideal. The former describes lateral vesico-uterine ligaments ; these are artefacts which do not exist. The inferior vesical artery is referred to instead of the vaginal artery. Halban's process of dissection fails to develop the fact that both the vesico-vaginal fascia anterior to the vaginal mucosa and the recto-vaginal fascia posterior to the vaginal mucosa consist essentially, not of one layer of fascia, but of the two closely opposed respective true visceral fasciae with a thin intervening layer of loose avascular areolar tissue ; the result is that the dissection in his operations is carried out in the vascular visceral tissue superficial to the deeper avascular areolar tissue, and must of necessity be unnecessarily haemorrhagic. He acknowledges that the anterior dissection is liable to be haemorrhagic and that the posterior one is often difficult, but he is apparently not aware that both these troubles are dependent on non-recognition of the two-layered nature of these fasciae.

Miller states that the cervix and the lower third of the uterine corpus are embedded in the musculo-fascial framework called the pelvic diaphragm, and states that the parturition injury which produces prolapse does so by stripping the cervix away from its fascial attachments. I have dissected carefully a great many cases of prolapse and found no evidence of this stripping. I find also that the normally situated cervix is considerably above the level of the true pelvic diaphragm at the top of a vaginal tube which ascends at an angle of about 70 degrees from the almost horizontally situated pelvic diaphragm. Therefore, if prolapse is a form of hernia through the pelvic floor aperture—a view which he subscribes to—it must be preceded by a pre-hernial ptosis to the level of the pelvic floor.

I think I have written enough to show that there still exists a good deal of incompleteness in the usual descriptions of anatomy in relation to the normal female pelvic viscera and in the application of surgical anatomy to prolapse conditions.

The reference in your leading article to Hortolomei and Burghele's contribution and the importance they attach to an efficient posterior colpo-perineorrhaphy reminds me of a paragraph in the Epitome of the *Journal* of March 12th. There, an abstract of an article by the Americans Hill and Van Del refers to an improved technique by deep dissection between the vagina and the levatores ani. The description suggests that the method was original, but it had already been more fully described in a publication of which I was the author eighteen months prior to the appearance of their article.

As regards Dr. Herbert Spencer's authoritative article on total abdominal hysterectomy in the *Journal* of June 23rd, I would be grateful for information as to whether prolapse is more likely to follow total than subtotal hysterectomy.—I am, etc.,

E. HESKETH ROBERTS, F.R.C.S.Ed.

London, W.1, Aug. 2nd.

SEPSIS IN OSTEO-ARTHRITIS

SIR,—In reading Dr. Matthew B. Ray's article on osteo-arthritis in the *Journal* of April 30th (p. 789) I feel that some comment is necessary in his description of the association of these conditions with focal infections. He mentions, "As Glover points out, 75 per cent. of the population over the age of 40 have septic teeth, yet nothing like this proportion suffer from arthritis" ; and states further that "this is abundantly borne out by the multitudes of edentulous patients one sees whose arthritic joints have been in no way benefited by the loss of their teeth." It is well known that iritis may be due to an infected tooth ; because this is so does not mean that everybody with an infected tooth is going to get iritis, any more than that they will get arthritis. The streptococcus or other organisms responsible for these conditions have a good many portals of entry, and why the teeth alone should be picked out is hard to say. There are the nose, tonsils, prostate, gall-bladder, appendix, etc., all to be considered, each of which foci can claim as many victims. One can well understand, therefore, the number of edentulous people still suffering from arthritic conditions where these other portals of entry have been overlooked.

The work of Rosenow has clearly shown that certain strains of streptococci have selective affinity for different tissues, and that it is only some of those which have affinity for joint tissues. There are all the other diseases of the body to be catered for by this self-same streptococcus. Every organ and tissue in the body is liable to invasion on occasion, and produces symptoms corresponding to irritation and damage of that tissue. Invasion of the different tissues round the joints—whether it be bone, capsule, synovial membrane, or ligamentous insertions—makes for variety in type ; and when on top of this we add varying degrees of virulence of the organism and varying degrees of resistance and response on the part of the individual, and irregularity of invasion, it seems idle to try to classify these types of arthritis into separate compartments. There is no sound reason to assume that injury or strain *per se* is a direct cause for any of these conditions, except in so far as they offer a more suitable site for lodgement of the invading organism. We have examples of old war injuries breaking out occasionally, due to strain or unwonted exertion ; but the removal of infected teeth or tonsils is usually sufficient to put a stop to such relapses. No effective treatment can be of any permanent use without the removal of the primary focus where possible.—I am, etc.,

Melbourne, June 20th. SYDNEY PERN.

PADDINGTON INFANT SAVING CAMPAIGN

SIR,—You were good enough to mention in the *Journal* of July 9th (p. 74) the work of this campaign in a way which should have made your readers interested. Because of lack of financial support this pioneering, experimental work recently undertaken by about forty doctors will have to be abruptly suspended.

May I, if only in fairness to these doctors, briefly supplement your notice, so as to help people to realize what a colossal blunder will be committed by the public, and how much genuine good is to be washed overboard by the end of this month because of a failure to find a few hundred pounds which would have enabled a perfectly organized team to complete, during the next two years, a novel task in medical sociology. One donor, who wishes to remain anonymous, has offered £100 a year for two years if others will subscribe the remaining £400 a year for two years.

The scheme might be called an ideal one, inasmuch as it not only represents the team spirit of a large body of local medical men and women, but it functions with the active co-operation of such organizations as the London Public Medical Service, which keeps an up-to-date register and distributes payments to doctors according to the number of quarterly units on each doctor's list, and which offers service facilities to infants after attaining the age limit of 12 months. We have the co-operation of the medical officer of health, of health visitors, and of the school for mothers. The scheme has worked pretty

smoothly during the first year of its existence, and no dissatisfaction has been expressed either by the doctors or by the parents. It was conceived to cater for about 400 to 500 infants from birth up to the first year, and it has so far absorbed over 200 of them, while the full complement would have been reached during the coming winter if we had been able to carry on.

I feel it necessary to stress two points. One is the surprising fact that the majority of the infants' deaths took place, and still to a great extent occur, in institutions and not in the homes. It was this factor that led us to the creation of a domiciliary service which would keep the infants out of hospitals as far as possible, especially seeing that the majority of these institutional deaths occurred from such common ailments as bronchopneumonia and gastro-enteritis, while the majority of them could quite easily be treated at home with the aid of efficient district nurses, thus also considerably reducing the costs of treatment as borne by the community.

The other factor is that, while the local authorities, such as county or borough councils, can and do provide assistance through their welfare centres and clinics for such infants as are not too ill to receive *ambulatory* treatment, these bodies have so far been expressly barred by legislation from organizing any domiciliary medical service consisting of medical practitioners for the benefit of infants whose ailments require such a *domiciliary* attention. As, however, our campaign was organized by the medical men themselves, you will readily appreciate, Sir, how perfectly the scheme filled this gap in the chain of medical services, particularly in Paddington, whose death rate amongst infants has for many years past been higher than in other London boroughs.—I am, etc.,

London, W.2, Aug. 2nd. G. de Swietochowski.

CALCIUM AND THE PARATHYROIDS

Sir,—There is one statement in Lord Dawson's stirring presidential address as reported in the *Journal* of July 30th that has mystified me. "Let these [parathyroid] glands become overactive," he says, "and the bones of the skeleton lose their calcium support and fractures ensue." In a previous sentence Lord Dawson points out that removal of these glands is followed by a fall in the calcium content, and that subsequent feeding with parathyroid extract restores the normal calcium equilibrium. This being the case, is it not more in accordance with fact that bone fractures consequent on overactivity of these glands is referable rather to relative increase of lime salts (the brittleness factor) in the total osseous content at the expense of the collagenous element, which provides the elasticity factor?—I am, etc.,

Charles M. Beadnell,
Ringwood, July 30th. Surgeon Rear-Admiral.

ADMINISTRATION OF NEMBUTAL

Sir,—Dr. Davidson, before the Section of Mental Disorder at the Centenary Meeting on July 27th, referred to the use of nembutal as a hypnotic in general practice. This drug is known to be relatively inactive when taken on a loaded stomach. I find the crude drug is readily soluble in neutral or alkaline aqueous solution but is converted to the insoluble basic acid by the presence of acids, and even by weak organic acids. This would explain the variable action of oral nembutal, and indicate the desirability of administering beforehand a sufficiency of an antacid such as magnesium hydroxide wherever the reaction of the gastric juice is doubtful—for example, during parturition, where the dose is sometimes repeated several times at intervals of two to three hours and nourishment cannot be withheld.—I am, etc.,

Penrith, July 31st. Alison N. Macbeth.

Obituary

MATTHEW HAY, M.D., LL.D., F.R.C.P.I. (Hon.)

The death took place on July 30th at his residence, 14, Rubislaw Terrace, Aberdeen, and in his seventy-eighth year, of Dr. Matthew Hay, emeritus professor of forensic medicine in the University of Aberdeen. Professor Hay, who was the son of a well-known colliery proprietor, was born near Falkirk in 1855.

After an early education at Dollar Academy, then a celebrated Scottish school, he took up the study of medicine at Edinburgh University, where he graduated M.B., C.M., with first-class honours, in 1878, being awarded the Ettles prize as the most distinguished student of his year. He later became demonstrator in materia medica at the University under the late Sir Thomas Fraser, a post which he held for five years, and in which he gained that special interest in toxicology which distinguished him in later years. During the vacations he enlarged his knowledge of this subject by study at Strasbourg, Berlin, and Munich. On proceeding to the M.D. degree at Edinburgh in 1881 he was awarded a gold medal for his thesis, and at the same time received the Goodsir memorial prize for physiological research. In 1884 he was appointed professor of pharmacology and therapeutics in Johns Hopkins University, Baltimore, but having meanwhile been elected to the chair of forensic medicine and public health in Aberdeen, he did not take up the duties of the former post. He occupied the professorship at Aberdeen for the long period of forty-three years, and from 1888 to 1923 was also medical officer of health for that city. In the latter year public health was separated from the chair of forensic medicine, and the late Dr. J. Parlane Kinloch became head of the public health department in the University, as well as succeeding Professor Hay in the post of medical officer of health for the city. They had been associated since 1914, when Dr. Kinloch became lecturer in public health under Professor Hay, and many of the important medical developments for which the Aberdeen Medical School became celebrated were the outcome of their co-operation. Professor Hay is credited with having been the originator of the idea of the joint hospitals scheme at Forresterhill in which the University, the voluntary hospitals, and the municipality were combined. For this scheme ex-Lord Provost Lewis succeeded in raising over £400,000, and the Prince of Wales, in laying the foundation stone of the new hospital, spoke in glowing terms of the possibilities that it opened up. The details were subsequently elaborated under the supervision of Dr. Parlane Kinloch in the six years before he became Chief Medical Officer to the Department of Health for Scotland. Professor Hay was more of an administrator than a worker at laboratory research, but while still engaged with materia medica he published the result of a valuable experimental research on the physiological action of saline cathartics, and in this connexion his name is best known for the sulphur bile-salts test which he devised in 1885. He was one of the first to suggest, in an article on "Typhus and vermin infection," published in 1905, the means of transmission now recognized for this disease.

Professor Hay figured as an expert witness in many *causes célèbres* of the past. In the Monson trial, which resulted in a verdict of "Not proven," he had given evidence for the defence, while Sir Henry Littlejohn had been medical witness for the Crown. During the course of his professorship Dr. Matthew Hay rendered services as examiner in his subject to various universities, including those of London, Manchester, Birmingham, Liverpool, and St. Andrews. To his own University of Aberdeen, as well as to the city, his administrative services were of a very high order. Becoming a member of its Univer-

sity Court in 1889, he was for many years its most important medical member, and was responsible for carrying out several of the developments that followed upon the Report of the Scottish Universities Commission of that year, his period of service on the court extending from 1889 to 1926. He also represented Aberdeen University on the General Medical Council from 1919 to 1924, and, more important perhaps, in connexion with Scottish medical education, he was for twenty years the representative of this university on the Carnegie Trust for the Scottish Universities during the period 1901–20. He was for a few years a member of the Medical Research Committee of Great Britain, and in 1913 was offered its secretaryship, but his numerous other duties prevented him from accepting this post. Other consultative posts which he held from time to time and in which his wide experience proved of great value included those of member of the Consultative Council for Medical Services of the Scottish Board of Health, chairman of its Research Committee, Governor of Aberdeen Technical College, and member of committee of the Rowett Research Institute for Animal Nutrition. He held the rank of lieutenant-colonel R.A.M.C.(T.) in the Sanitary Service. He was also a prominent member of the British Medical Association, and in his early days was elected a vice-president of the Section of Pharmacology and Therapeutics at the Belfast Meeting of 1884 ; while at the meeting of 1914, in Aberdeen, he acted as president of the Section of State Medicine and Medical Jurisprudence. Professor Hay was honoured by the bestowal of an LL.D. degree both by his Alma Mater, Edinburgh, and by Aberdeen University, which he had served so well, while the Royal College of Physicians of Ireland made him an honorary Fellow.

Professor Hay in 1884 married Margaret, daughter of the late John Crawford, shipowner of Grangemouth, Scotland. She predeceased him in 1926, and he is survived by four sons and two daughters. A funeral service was held on August 2nd in the Mitchell Hall, Marischal College, Aberdeen, which was attended by representatives of the University and municipality of Aberdeen, and the interment took place on the following day at Camelon Cemetery, Falkirk.

PATRICK THOMAS O'SULLIVAN, M.D., M.R.C.P.

The death took place recently, in his sixty-fifth year, at his residence, South Mall, Cork, of Patrick Thomas O'Sullivan, M.D. R.U.I. Dr. O'Sullivan had had his early education at the North Monastery, Cork. Having passed the matriculation and other arts examinations in the Royal University, he commenced his career as medical student in the Queen's College (now University College), Cork. He had a distinguished career as a student in the medical school, having gained scholarships and exhibitions during his entire course. He obtained his M.B., B.Ch., and B.A.O. in 1891, M.D. R.U.I. in 1901, and M.R.C.P.Lond. in 1909. Immediately after being qualified he was appointed by Professor J. J. Charles as assistant lecturer and demonstrator of anatomy in the medical school of the Queen's College. After the abolition of the Royal University (Ireland) and the establishment of the National University, he was appointed senator of the latter body, a position which he held until his death. He succeeded Professor W. Ashley Cummins as professor of medicine in the medical school, University College, Cork, which became one of the constituent colleges of the new National University of Ireland.

Dr. O'Sullivan held many important hospital appointments, being senior physician in the Cork South Charitable Infirmary and physician to St. Vincent's Hospital for Women and Children. He had a large consultant practice throughout Munster. Although a very busy man he always took a keen interest in medico-political matters, and was a past-president of the Munster Branch of the British Medical Association and an ex-president of the Cork Medical and Surgical Society.

Dr. J. W. McNee writes: My absence on holiday abroad prevented me from knowing of Professor O'Sullivan's death until long after the event, but I should like to be privileged to write a few words in his memory. He was known to have suffered from diabetes for some time, with cardiac complications, and he died on June 15th, aged 67. I was his co-examiner in Cork for three years, and frequently his guest, so I knew him well. P. T. O'Sullivan, a big man physically and mentally, was for many years one of the outstanding figures in the medical life of the South and South-West of Ireland, and had a strong influence on all the students who passed through his hands. He was a first-rate general physician, brusque at times, but full of common sense and kindliness, and equally at home in general medicine, in fevers, in children's diseases, and in dermatology. He was seen at his very best with Mrs. O'Sullivan in his beautiful house and garden at Feltrim, near Cork, among his children and grandchildren. His favourite relaxation was fishing in his beloved Kerry. O'Sullivan was a thorough Irishman, but one of the few who, while in active work in Ireland, took a higher London degree—he became M.R.C.P.Lond. in 1909. He is survived by his widow, and of his family two have entered their father's profession—Dr. T. D. O'Sullivan of Cork and Dr. Maureen Lahiff, wife of Dr. E. P. Lahiff of Mitcham, Surrey.

THE LATE DR. GEORGE GIBSON

Dr. Halliday Sutherland writes:

The untimely death of George Gibson was a shock to his friends, and now, all over the world, Edinburgh men of the 1900's will be retelling those high-spirited stories of joyous adventures of "Young George," but none of us will ever tell them as well as he did. To some of us he was "Young George" to the end. His father, J. A. Gibson, was the leading and most popular consultant of his time in Scotland, and between father and son there existed a degree of affection, confidence, and mutual respect which is rare. But the son was sensitive lest any should think that he was trading on his father's reputation. He went out of his way, in fact to Canada, to establish his independence. Some thought this quixotic, but it was a mental attitude which his father appreciated. In 1914 George Gibson went to France, and within two years had risen from Captain to be D.A.D.M.S. to the Canadian Corps. He had great abilities, the command of adjectives, the power of narrative, and a genius for friendship. There was nothing mean or jealous in his nature, and he was most generous in appreciating any achievements of his friends. Unfairness was one of the things which he found hard to forgive. When George Gibson died the trumpets were not sounding, but by his life he had made this world a very much happier place for many of us than it would otherwise have been. When we come to ultimate and eternal values that is perhaps a better memorial than monuments of brass.

Dr. Charles Edward Hetherington died at Londonderry, at the age of 84, on July 25th. He was the last surviving son of the late Dr. George Hetherington of Athlone, Co. Westmeath, and was educated at Portora Royal School and Trinity College, Dublin, where he graduated M.B., M.Ch. in 1870. First appointed house-surgeon of Sir Patrick Dun's Hospital, Dublin, he afterwards became assistant medical officer in Downpatrick Infirmary and at the Downpatrick District Asylum. Endowed with unusual professional gifts and a charming personality he quickly won all hearts when, as a young man of 28, he came to Londonderry as resident medical superintendent of the district asylum. He filled this post with great distinction for forty-three years, till his retirement in September, 1919.

The death has occurred in his seventy-fourth year of Dr. FRANCIS JOHN ALLAN, formerly editor of *Public Health*. A fellow of the Royal Society of Edinburgh and of the Royal Sanitary Institute, Dr. Allan had acted for thirty-six years as medical officer of health to the Westminster City Council. Born in Dumfries, he obtained the M.B.Ed. in 1880, took his M.D. in 1883, and the D.P.H. in 1887. He held many appointments as lecturer on and examiner in public health, published several books on the subject, and during the war did advisory work in the sanitary service as a captain of the R.A.M.C.(T.). Since his retirement, seven years ago, he had lived at Teddington. He was a keen Freemason. Dr. Allan was a past-president of the Society of Medical Officers of Health, and for many years served as chairman of the Medical Sickness, Annuity, and Life Assurance Company.

The following well-known foreign medical men have recently died: Professor GUSTAV ALEXANDER, director of the Otological Department of the General Policlinic of Vienna since 1917, aged 58; Geh. San Rat Professor GUSTAV ADOLF NEUBER of Kiel, for many years collaborator of Esmarch and a pioneer in the aseptic treatment of wounds, aged 82; Dr. JULIUS STUMPF, professor of forensic medicine at Würzburg, aged 76; and Dr. HEINRICH SCHROTTENBACH, extraordinary professor of neurology and psychiatry at Graz, aged 47.

The Services

DEATHS IN THE SERVICES

Lieut.-Colonel James Dunlop Kidd, M.C., O.B.E., R.A.M.C. (ret.), died in London on July 15th, aged 49. He was born on April 4th, 1883, and was educated at Glasgow University, where he graduated as M.B. and Ch.B. in 1906. Entering the R.A.M.C. as lieutenant on January 29th, 1911, he became major on January 1st, 1919, and retired on April 20th, 1929, with a step in rank. He took the diploma of D.M.R.E., Cambridge, in 1922, and thereafter specialized in radiology, serving as radiologist to the military hospitals at Rawal Pindi, Poona, and Sikandarabad, the Herbert Hospital at Woolwich, and Queen Alexandra's Military Hospital at Millbank, and also as lecturer in radiology at the R.A.M.C. College at Millbank. During the war of 1914–18 he served in the East African campaign, where he acted as A.D.M.S. at headquarters, was mentioned in dispatches in the *London Gazette* of March 7th, 1918, and received the M.C. and the O.B.E.

Major Robert Linton Ritchie, O.B.E., R.A.M.C., died suddenly at Shanghai on July 22nd, aged 42. He was born on December 4th, 1889, the only son of Dr. and Mrs. Ritchie of Edinburgh, and was educated at the university in that city, where he graduated M.B. and Ch.B. in 1914. After serving a term as house-physician in the Edinburgh Royal Infirmary, he took a temporary commission as lieutenant in the R.A.M.C. on April 1st, 1915, becoming captain after a year's service. He subsequently took a permanent commission, from April 1st, 1915, and became major after twelve years' service. He served throughout the war of 1914–18, and received the O.B.E.

Captain William John Anson Coldstream, Indian Medical Service, was murdered at Peshawar on July 22nd, aged 31, by a Moslem ward orderly, who is supposed to be insane. He was born on July 15th, 1901, the son of Colonel W. M. Coldstream, R.E.(ret.), of Curdridge, Hampshire, and was educated at Wellington College, where he was in the Rugby fifteen and in the shooting eight, and was featherweight boxing champion. At Edinburgh University he graduated M.B. and Ch.B. in 1925, having held a Vans Dunlop scholarship, and also gained the Ettles scholarship, awarded to the best graduate of the year. He subsequently took the F.R.C.S.Ed. in 1930. He was appointed to the I.M.S. as lieutenant on September 27th, 1926, with seniority from October 1st, 1925, and became captain on October 1st, 1928. He had till recently been an agency surgeon on the North-West Frontier, and in medical charge of the South Waziristan Scouts; in recognition of his good work in these capacities he was appointed civil surgeon of Peshawar, the chief town of the North-West Frontier Province. He leaves a widow.

Universities and Colleges

UNIVERSITY OF LONDON

The following have been recognized as teachers of the University at Charing Cross Hospital Medical School in the subjects indicated:

Medicine: Drs. W. J. Adie, R. A. Hickling, Gordon M. Holmes, K. Shirley Smith, E. C. Warner, and F. H. Young. *Surgery:* Messrs. H. E. Batten (orthopaedic), L. R. Broster, E. A. Crook, Norman C. Lake, A. C. MacLeod, and C. Jennings Marshall. *Oto-Rhino-Laryngology:* Dr. L. G. Brown. *Obstetrics and Gynaecology:* Drs. Arthur O. Gray and Everard H. G. Williams. *Children's Diseases:* Mr. C. K. J. Hamilton. *Anaesthetics:* Mr. W. Howard Jones. *Pathology:* Dr. Jocelyn Patterson. *Mental Diseases:* Dr. A. A. W. Petrie. *Dermatology:* Dr. J. E. M. Wigley.

It has been decided that in and after the session 1933–34 the title of M.D. (Hygiene) shall be substituted for M.D. (State Medicine), and the regulations for the degree are to be amended accordingly.

Professor Carl Prausnitz of the University of Breslau will deliver the Heath Clark Lectures on the teaching of preventive medicine in Europe at the London School of Hygiene and Tropical Medicine, on October 17th, 18th, 19th, 20th, and 21st at 5 p.m. Sir George Newman will take the chair at the first lecture.

A course of two lectures on *Sinanthropus* will be given by Dr. Davidson Black of the Peiping Union Medical College, China, at University College in December.

Sir William Willcox has been appointed the representative of the University at the third International Congress of Rheumatism in Paris from October 13th to 15th, 1932.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

A quarterly meeting of the College was held on July 19th, when the president, Dr. Robert Thin, was in the chair. Dr. John McIntosh Morgan, *M.C.* (Dundee), was introduced and took his seat as a Fellow. The meeting then adjourned owing to the sudden death, that afternoon, of Dr. George Gibson, D.S.O., Secretary of the College.

At the adjourned quarterly meeting, held on July 25th, the vice-president, Sir Norman Walker, was in the chair. Dr. Alec Bache Walker (Newtongrange, Midlothian), Dr. Puthukkeril Koshy Koshy (Madras), and Dr. Derrick Melville Dunlop (Edinburgh) were elected Fellows.

Dr. John D. Comrie, F.R.C.P., was appointed the Dr. Alexander Black Lecturer for 1933.

At an extraordinary meeting which followed Thomas Francis Roche was suspended *sine die* and deprived, until the said suspension is removed or remitted, of all the rights and privileges which, as a licentiate, he does, or may, enjoy.

Medical News

The first half of the session 1932–3 of the Medical Society of London begins on October 10th, when the annual meeting takes place at 8 p.m. Sir John Broadbent will deliver his presidential address at 8.30 p.m. On Monday, October 24th, Mr. W. Warwick James and Sir Harold Gillies will open a discussion on fractures of the lower jaw, at 8.30 p.m. A clinical evening will be held on Monday, November 14th, at 8 p.m. A discussion on the use and abuse of massage will be introduced on Monday, November 28th, at 8.30 p.m., by Dr. A. H. Douthwaite and Mr. Gwynne Williams, and on Monday, December 12th, at 8.30 p.m., Dr. R. A. O'Brien and Dr. William Gunn will open a discussion on skin tests in tuberculosis and exanthemata. The Lettsomian Lectures on the pathology of acute abdominal disease will be delivered by Mr. Zachary Cope on February 20th, March 1st and 6th, and the annual oration by Sir Thomas Horder on May 8th, 1933.

The fifth annual graduate fortnight of the New York Academy of Medicine, from October 17th to 28th, will be devoted to neoplastic diseases. The programme comprises free hospital clinics, evening meetings, and a scientific exhibit. A full programme and registration form for clinics and demonstrations may be obtained on application to the New York Academy of Medicine, 2, East 103rd Street, N.Y.

A course in diseases of the cardiovascular system will be held at the Broussais Hospital, Paris, from October 10th to 22nd inclusive. Besides formal lectures on the recent advances in cardiac disease, and the newer methods of diagnosis and treatment, there will be practical clinical work each afternoon. The fee for the course is 150 francs, and a certificate will be given at its conclusion. Further information may be obtained from Dr. L. Matton, l'Hôpital Broussais, rue Didot 96, Paris XIV.

The Fellowship of Medicine and Post-Graduate Medical Association announces that the second week of the course in urology at All Saints' Hospital, Austral Street, S.E.11, will be held from August 15th to 20th. Afternoons will be devoted to clinical and cystoscopic demonstrations.

The Fellowship of Medicine and Post-Graduate Medical Association has arranged for a course in diseases of the chest to take place at the Brompton Hospital from September 5th to 10th; all-day instruction will be given. A course in psychological medicine will be held at the Bethlem Royal Hospital on Tuesdays and Fridays at 11 a.m., from September 6th to 30th, and a special week-end course in clinical surgery will be held at the Royal Albert Dock Hospital on Saturday and Sunday, September 3rd and 4th, all-day instruction being given. Individual clinics at various general and special London hospitals are available daily through special arrangements with the Fellowship. All courses of instruction, clinics, etc., are open only to members.

The First International Congress of Mediterranean Hygiene will be held at Marseilles from September 20th to 25th, under the presidency of Dr. E. Marchoux, professor of the Institut Pasteur, Paris. The subjects for discussion will be Spanish spirochaetosis, introduced by Dr. Sadi de Buen ; undulant fever, introduced by Dr. Burnet ; dengue, introduced by Dr. Blanc ; modern methods of clearing rats from ships, introduced by Dr. Lutrario ; and Mediterranean exanthematous fever, introduced by Dr. Olmer. The subscription is 100 francs, which should be sent to the treasurer, Dr. G. Baillière, 19, rue Hautefeville, Paris vi.

The fourth Italian Congress of Anatomy will be held at Pavia from October 14th to 17th, when the centenary of the death of Antonio Scarpa will be celebrated. The following papers will be read: " Scarpa in the history of normal anatomy," by G. Favaro ; " Sex and sexual cells in their intermediate stages," by C. Artom ; and " The most important results in the morphology and palaeobiology of the primates," by G. L. Sera.

The King has granted his royal licence and authority to Major R. G. Archibald, C.M.G., D.S.O., M.D., to wear the Insignia of the Second Class of the Order of the Nile, conferred on him by the King of Egypt in recognition of valuable services rendered while in the employment of the Sudan Government.

A pamphlet—*The Prevention during Childhood of Diseases in Later Life*—by Dr. Richard Ackerley, can be obtained, post free 3½d., from the Food Education Society, 29, Gordon Square, W.C.1.

In the June issue of the *Bulletin de l'Office International d'Hygiene Publique* Sir George Buchanan gives a survey of the number of deaths from influenza in England and Wales for the four weeks ending January 2nd, 1932, in 107 large towns, where they ranged from 33 to 240 in January–October, followed by the deaths in the subsequent fourteen weeks ending April 9th, 1932, in 118 large towns, where they ranged from 412 in January to 114 in April. The epidemic period was not marked by a serious outbreak like that of 1929. The highest number of deaths per week was 412, reached in the week ending January 9th, 1932, as compared with 2,183 in 1929. No unusual features were noted in the 1932 epidemic apart from the fact that it was prolonged by a slight rise, apparently due to bad weather, when it appeared to be on the decline. The age distribution of deaths was normal, the oldest groups paying the heaviest tribute. The clinical features did not differ from those noted in previous epidemics.

The July issue of the *Monatsschrift für Geburtshilfe und Gynäkologie* is dedicated to Dr. Ludwig Seitz, professor of gynaecology at Frankfurt, on the occasion of his sixtieth birthday.

The summer number of *The Fight Against Disease*, the quarterly journal of the Research Defence Society, contains the text of Sir Arthur Keith's Stephen Paget Memorial Lecture entited " Some aspects of the modern conflict between sentiment and reason," of which a report appeared in our issue of June 25th.

Mr. James McKay will retire at the end of August from the secretaryship of the Hospital for Sick Children, Great Ormond Street, after thirty-seven years' association with that institution.

The Lord Chancellor has appointed Dr. W. Johnson Smyth as a Justice of the Peace for the county borough of Bournemouth.

Professor Hans Horst Meyer, the well-known pharmacologist, has recently been made a freeman of the city of Vienna on the occasion of the fiftieth anniversary of his academic teaching.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to **The EDITOR, British Medical Journal, British Medical Association House, Tavistock Square, W.C.1.**

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

Authors desiring REPRINTS of their articles published in the *British Medical Journal* must communicate with the Financial Secretary and Business Manager, British Medical Association House, Tavistock Square, W.C.1, on receipt of proofs.

All communications with reference to ADVERTISEMENTS, as well as orders for copies of the *Journal*, should be addressed to the Financial Secretary and Business Manager.

The **TELEPHONE NUMBERS** of the British Medical Association and the *British Medical Journal* are *MUSEUM* 9861, 9862, 9863, and 9864 (internal exchange, four lines).

The **TELEGRAPHIC ADDRESSES** are:
EDITOR OF THE *BRITISH MEDICAL JOURNAL*, *Aitiology Westcent, London.*
FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate Westcent, London.*
MEDICAL SECRETARY, *Mediscera Westcent, London.*

The address of the Irish Office of the British Medical Association is 18, Kildare Street, Dublin (telegrams: *Bacillus, Dublin* ; telephone: 62550 Dublin), and of the Scottish Office, 7, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh* ; telephone: 24361 Edinburgh).

QUERIES AND ANSWERS

Sterilization of Dressings, etc.

" K." wishes details as to the time required, etc., for using a low-pressure Schimmelbusch sterilizer for dressings and instruments.

Bibliography Needed

" C. M. B." writes: I would be grateful to any reader who would furnish me with the names of concise and up-to-date publications concerning: (*a*) the classification of animals ; (*b*) the classification of plants ; and (*c*) the hormones and endocrine organs.

Plantar Corns

" CLAVUS " (South Africa) writes: May I thank the many readers who have replied to my query in the *Journal* of April 9th (p. 692). I have tried several of the treatments recommended ; but results being, to say the least, slow, I am now enduring ionization at the hands of a kind electrotherapeutic friend. It is certainly rather painful and crippling, but promises well. However, in order to be fair, I shall try side by side with this method (on different corns, of course) that recommended by Dr. Fraser, although I am convinced that my pet afflictions are infective, and not merely the result of pressure—several, indeed, are not on pressure spots. The first correspondent who was kind enough to reply suggested, *inter alia*, the *B.P.C.* ung. acid. benzoici co. for the interdigital condition, and with that treatment I can report a rapid and striking (and I hope permanent) cure.

Income Tax

Wear and Tear of Instruments

"A. D. B." is a resident medical officer, and under his service agreement he has to provide his own instruments. The inspector of taxes declines to allow wear and tear on the amount (£40) so expended.

*** The inspector is correct. Professional instruments fall under the category of "implements, utensils, or articles employed for the purposes of the . . . profession," and the appropriate allowance is the deduction from gross income of the cost of replacements and repairs as and when incurred. The depreciation allowance, which meets the replacement cost in advance, is applicable to "plant and machinery," a phrase which does not cover instruments of the normal type.

Discontinuance of Employment

"ASSISTANT" discontinued his employment on January 1st, 1932, and became a whole-time student. On what basis will his liability be computed for each of the two years ending April 5th, 1932 and 1933?

*** For the year 1931-2 the existing assessment should be adjusted to the amount of the earnings of that year—that is, of the nine months to December 31st, 1931. For 1932-3 there will be no assessment on earnings, because the employment ceased prior to that year and there is no source of assessable income. The requirement of the inspector of taxes that a return should now be made of the income of the year 1931-2 is, we presume, made so that the assessment for that year may be adjusted.

Colonial Government Service: Residence in United Kingdom

"D. M." holds an appointment as M.O.H. in a colony. He proposes to buy or rent a house in the United Kingdom, where normally he would spend less than six months every second year. How would that affect his income tax liability?

*** If he carries out his intention he will become an English resident, and as such will be liable to account for income tax here on such portion of his income as arises in, or is remitted to, this country—for example, on the 50 per cent. of the salary paid to his dependants if that arrangement be adopted. In calculating the amount of tax payable the usual allowances will be made and a deduction given for the tax paid abroad. If furnished rooms are taken for long periods the legal position is the same, but is not demonstrated in so immediate and definite a way, and the authorities might perhaps defer charging the British tax until the arrangement had been in force some time to see whether an habitual residence had in fact been set up in this country.

LETTERS, NOTES, ETC.

A Case of Haemorrhagic Measles?

Dr. S. K. CHAUDHURI (chief medical officer, Benares) writes: A Hindu girl, aged 9 years, was seen on May 22nd. Her parents stated that she had been in the same house with her cousins, who had measles. Her fever was of three days' duration. She had inflamed tonsils, and her face was flushed. Koplik's spots were noticed, and a diagnosis of measles was made. Typical eruption made its appearance on May 25th. On the same day she complained of restlessness and nausea, and vomited blood in large quantities. The haematemesis lasted for six hours, and her pulse became almost uncountable. Normal horse serum, iced and sweetened, was given by the mouth, and ice application was made to the pit of the stomach. The temperature, which had risen to 103°, was also controlled by the cold application. By May 28th the fever subsided. The same morning she passed blood-tinged urine only once. Since then her convalescence has been uneventful. An adult brother of the child's mother who was treated for kala-azar had died of haematemesis two weeks before the child was taken ill. Clinical evidence pointed to gastric ulcer as the cause of this. *X*-ray examination was not practicable.

Pituitrin in Malignant Disease

Dr. J. N. MCINTOSH (Port Royal, Jamaica) writes: In the *Journal* of May 14th Riches and Kremer showed that the theoretical and experimental observations of Susman on the effect of injections of posterior pituitary extract and theelin combined with a low carbohydrate diet on malignant growths failed to prolong life; nor was there regression of any of the growths. In the *Journal* of December 27th, 1930, I put forward the theory that "there is a close relation between a faulty carbohydrate metabolism and malignant growths, and that the hormones (especially that of the islets of Langerhans), closely linked up with the coaction of the autonomic nervous system, determine whether the local pathological process is to be one of diabetes or malignant neoplasm. It seems that if the tissues first become thoroughly 'bathed' in fermentative products from an auto-intoxication (so-called 'antibodies'), it is utterly impossible for a malignant growth to appear, and the only disease present will be diabetes. On the other hand, if the pancreatic 'autacoid,' through its chalones, causes a 'mild' depression on the tissues, then the pathological process present may be malignancy, the outstanding feature, associated with a glycosuria." Still holding this theory, I suggest that the failure of Riches and Kremer to obtain satisfactory results in their clinical observations is due to a continued "mild depression of the cancer soil," due to the low and faulty carbohydrate diet in treatment, and that it would be worth while—in conjunction with post-pituitrin and theelin—giving an excessive carbohydrate diet with the object of producing a diabetic condition which could be controlled by insulin.

Pyloric Stenosis and Tetany

"P. T." writes: In your issue of July 16th, p. 100, I was very much interested in Dr. G. M. Wauchope's case, where symptoms arose in late adult life from a congenital pyloric stenosis, and which were associated with tetany. I was able to observe a similar case—though the actual condition has been unascertained by an *x*-ray examination—in which the symptoms, apart from the vomiting, mildly simulated those of the case referred to above: tingling of the fingers, sensations of tightness in the chest with cramp. Singularly enough there was oedema, chiefly of the legs, which passed off spontaneously. It was found, moreover, that a diet which provokes the minimum amount of gastric digestion is the most conducive to the passing off of the symptoms, which a quickly emptying stomach seems to control. This has been the only method that has been given a trial, in view of the mild character of the case, which nevertheless points definitely to some pyloric anomaly.

British Legion

The annual report of the National Executive Council of the British Legion for the year ending September 30th, 1931, records an encouraging extension of the machinery for establishing employment bureaux throughout the country. This obtaining of suitable and permanent occupations for the Legion members is described as being the most important of all the constructive work which this organization is accomplishing. There are now 3,343 local British Legion and United Services Fund Benevolent Committees, numbering 40,000 voluntary workers, who are engaged in the distribution of relief in necessitous cases. At the end of September last year there were 3,715 active branches of the Legion, including 123 in the Irish Free State, 75 in Northern Ireland, and 54 over-seas. It is mentioned in the report that very often these oversea branches are the sole centres of British activities in isolated parts and foreign towns, contributing in no small measure to the maintenance of British prestige abroad. Their number continues to increase gradually; new branches were formed during the year under review at Knocke (Belgium) and in the Philippines.

A Warning

A medical practitioner in the South of England asks us to warn members of the profession against giving orders for stationery to a man representing himself to be the agent of a firm in North London. He shows samples of doctors' stationery and asks for a deposit, but the goods are not delivered.

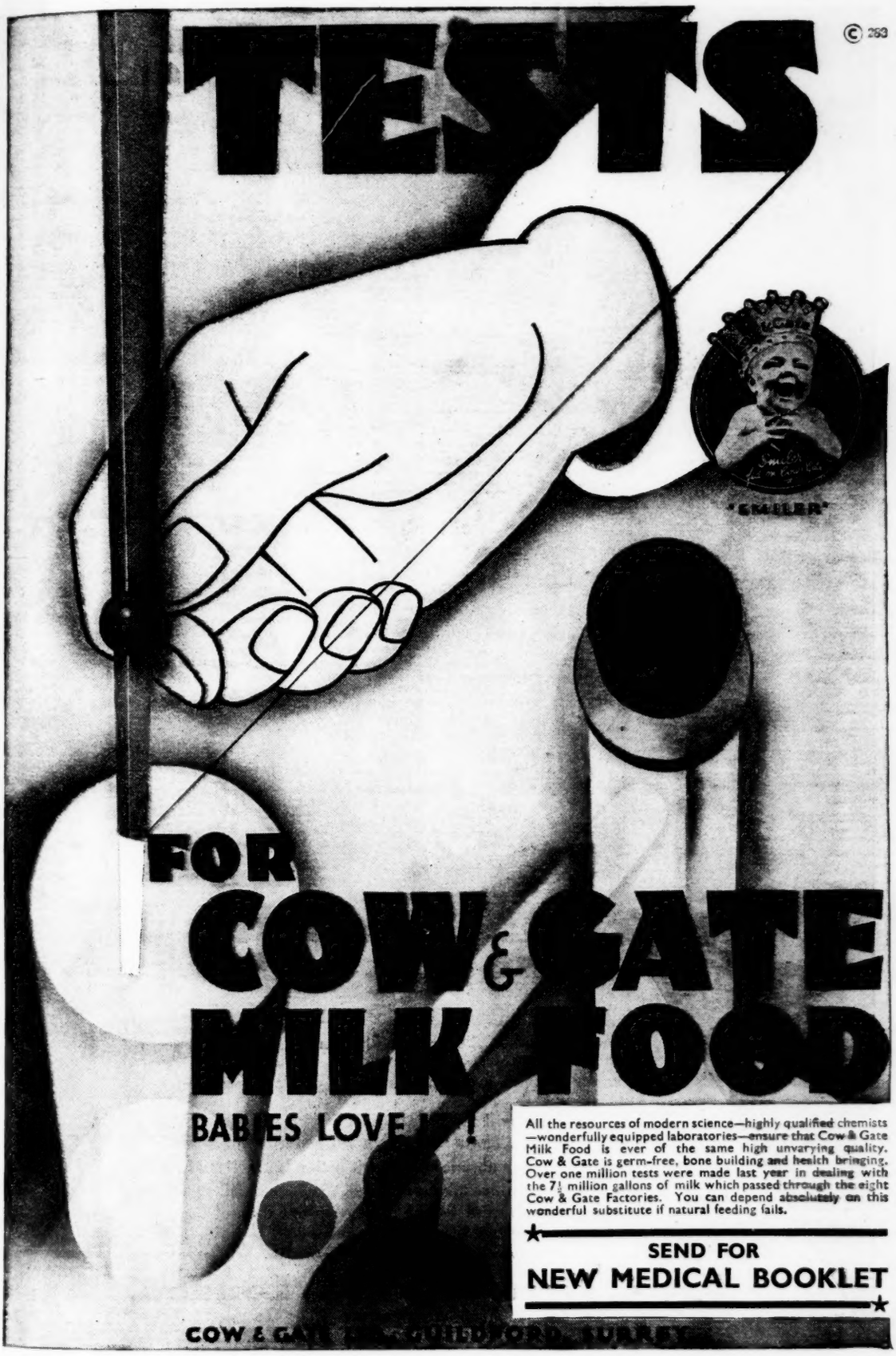
Corrigendum

In the report of the proceedings of the Section of Obstetrics and Gynaecology in the *Journal* of August 6th (p. 255), Professor Munro Kerr's remark that he "advocated vaginal or abdominal hysterectomy" should read "advocated vaginal or abdominal hysterotomy."

Vacancies

Notifications of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 32, 33, 34, 35, 38, and 39 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 36 and 37.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page *136*.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Printed and published by the British Medical Association at their Office, Tavistock Square, in the Parish of St. Pancras, in the County of Lond